MANAGEMENT REQUIREMENTS FOR TOURIST LANDING SITES IN THE MARITIME ANTARCTIC, AND A MODEL PLAN FOR DECEPTION ISLAND, SOUTH SHETLAND ISLANDS

Bill Davis
Scott Polar Research Institute
University of Cambridge

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SCOTT POLAR RESEARCH INSTITUTE
120732

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In accordance with the University of Cambridge Regulation 8 of the General Regulations for the Master of Philosophy Degree, I do hereby declare that:

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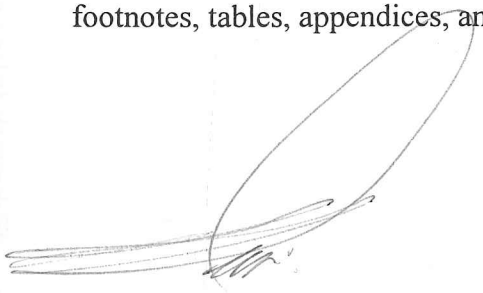
This thesis does not exceed the maximum allowable length of 20,000 words, excluding footnotes, tables, appendices, and references.



Bill Davis
11th of June, 1999

Abstract

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Increasing tourist visits to the Maritime Antarctic potentially threaten to damage scientific research, and the environment of landing sites. The current obligatory and hortatory requirements have been developed to control activities of tourists, and not to manage the land they use. This protection is insufficient to mitigate such latent problems.

This thesis investigates the Antarctic Treaty System (ATS), in particular the Madrid Protocol of 1991 (Protocol), to elucidate the requirements desirable to manage individual landing sites. The Area Protection and Management System of Annex V of the Protocol provides for two designations, Antarctic Specially Managed Area (ASMA) and Antarctic Specially Protected Area (ASPA), which could be a method to achieve this. The ASMA was identified as the more appropriate method.

Annex V requires a management plan for an ASMA. Plans from six other wilderness areas are evaluated to determine common criteria that are essential for management. The requirements for an ASMA contain all of these criteria, except those pertaining to enforcement by a sovereign authority. Without provisions for enforcement, an ASMA could not be considered as effective as plans elsewhere in the world. However, when sufficient information is provided to a tour operator the enforcement provided by self-regulation at tourist-landing sites has generally proven to be effective.

A management plan is developed in compliance with the regulatory and hortatory requirements and by implementing the criteria determined essential in this study. Three areas of Deception Island are used as a case study to demonstrate that an effective management plan for tourist landing sites can be drafted. Furthermore, the format developed in this study should be considered as a model for future ASMA management plans.

Acknowledgements

This research would not have been possible without the generous and enthusiastic support of many people from all seven Continents. Although they have contributed in different ways, all errors or omissions are my own.

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List of Acronyms

ACA	Antarctic Conservation Act
AHT	Antarctic Heritage Trust
APMS	Area Protection and Management System
ASMA	Antarctic Specially Managed Area
ASOC	Antarctic and Southern Ocean Coalition
ASPA	Antarctic Specially Protected Area
ASTI	Area of Special Tourist Interest
ATCM	Antarctic Treaty Consultative Meeting
ATCP	Antarctic Treaty Consultative Party
ATS	Antarctic Treaty System
BAS	British Antarctic Survey
CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources
CEE	Comprehensive Environmental Evaluation
CEP	Committee for Environmental Protection
COMNAP	Committee of Managers of National Antarctic Programs
EPA	Environmental Protection Agency
HSM	Historic Sites and Monuments
IAATO	International Association of Antarctica Tour Operators
IEE	Initial Environmental Evaluation
IMO	International Maritime Organization
MARPOL	International Convention for the Prevention of Marine Pollution from Ships
MPA	Multiple-use Planning Area
NGO	Non-Governmental Organization
NSF	National Science Foundation
PAC	Project Antarctic Conservation
SCAR	Scientific Committee on Antarctic Research
SOLAS	Safety of Life at Sea
SPA	Specially Protected Area
SRA	Specially Reserved Area
SSSI	Site of Special Scientific Interest
UK	United Kingdom
US	United States

Chapter 1
Introduction

1.1 Introduction

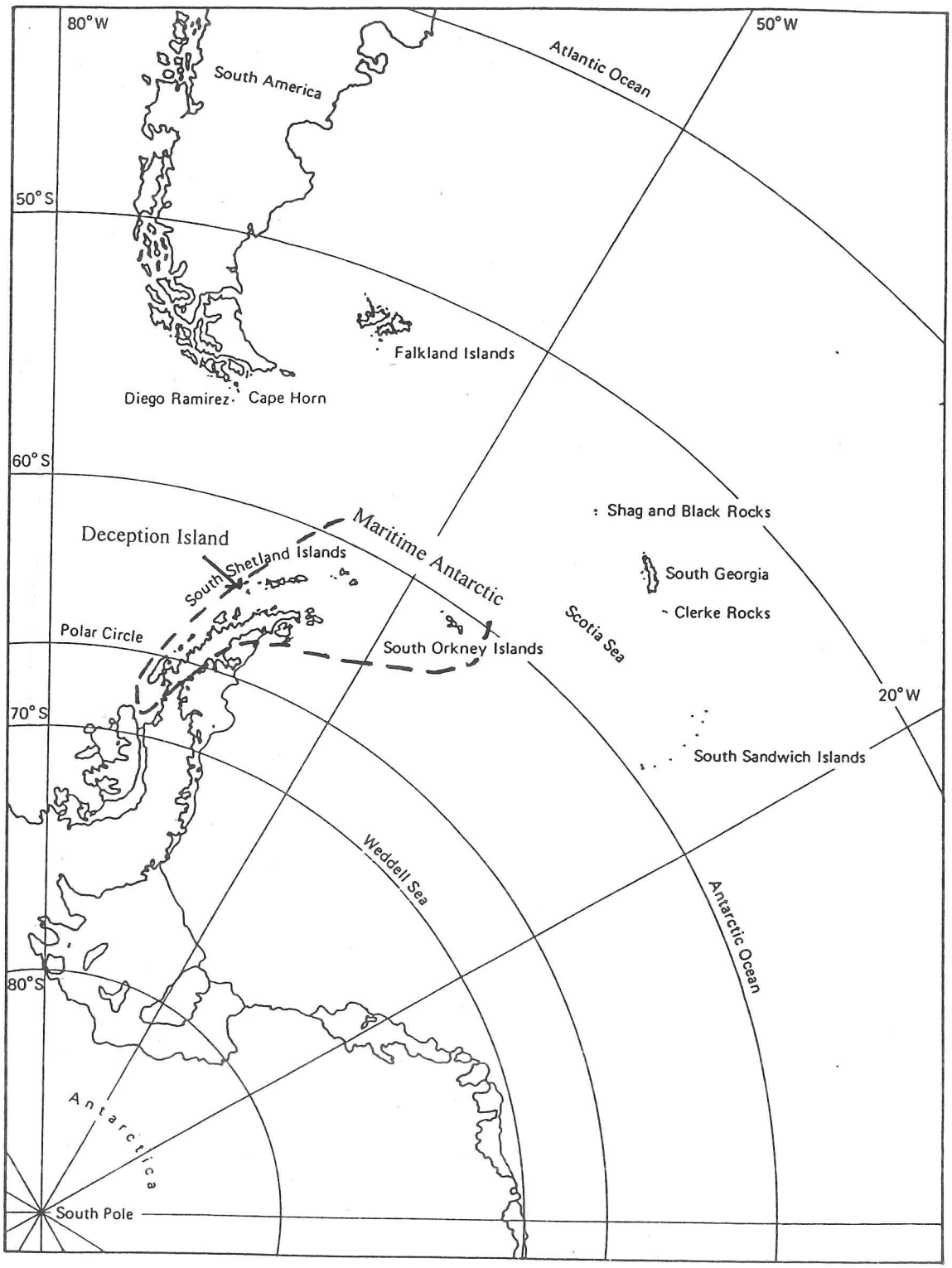
This thesis discusses the best methods to manage tourist landing sites in the Maritime Antarctic under the terms of Annex V of the Madrid Protocol on Environmental Protection to the Antarctic Treaty (Protocol) (see section 2.2.1). Landing sites are shore areas, visited by tourists, and the principal concern of this thesis (section 1.4). There are 128 different landing sites that have been identified in the Maritime Antarctic (Crosbie, 1998: 95), of which 104 were visited during the 1998-99 summer (Barrio, A. and Roldan, G., pers. com.). These sites have a wide range of sensitivities to human presence, yet the number of tourists and visits received are rapidly increasing each year. There are currently no management objectives nor plans, nor protective mechanisms provided for any of these sites.

Antarctica is, in effect, governed under the Antarctic Treaty System (ATS), which provides for management of human activities under the Protocol (Chapter 2). Although no direct provision was made for tourism under the Protocol, this thesis reviews a possible method of management, in particular the Antarctic Specially Managed Area (ASMA) (Chapter 3 and 5).

Deception Island, South Shetland Islands (Chapter 6) is ranked as the most frequently visited place in the Maritime Antarctic. On the island there are numerous research projects by several different countries, and three major tourist-landing sites which have various needs for protection and management. This thesis proposes a model plan for an ASMA which includes the three landing sites on Deception Island, and concludes that it can provide effective management which could be a prototype for future ASMAs.

1.2 The Maritime Antarctic

Holdgate (1964: 181-183) divided geographically the Antarctic by its climate and



Map 1.1 Maritime Antarctic is the areas encompassing the South Shetland Islands, South Orkney Islands, Palmer Archipelago and the West Coast of the Antarctic Peninsula. The southern boundaries are 64° S on the East Side side of the Antarctic Peninsula and 69°S on the West Side of the Peninsula. Source; Headland (1984).

other factors into two areas; Continental and Maritime. He described the Maritime Antarctic as the areas encompassing the South Shetland Islands, South Orkney Islands, Palmer Archipelago and the West Coast of the Antarctic Peninsula (Map 1.1). Stonehouse (1989: 52-55) defined the southern boundary of 64° S on the East Side (Weddell Sea side of the Antarctic Peninsula) and 69°S on the West Side of the Peninsula (Bellingshausen Sea) (Map 1.1).

The temperatures in this area rarely fall below -10C° in the winter, and summer usually has at least one month with temperatures above 0 C° (Holdgate, 1964: 183). This climate influences the ecology which include: virtually all the breeding bird species, mosses, liverworts, lichens, the only two flowering plant species, and various substrate organisms (Crosbie, 1998: 7).

The climate and geographical proximity to South America are the primary reasons why over 90% of all shipborne visits to the Antarctic are within the Maritime region.

1.3 Seaborne tourism in the Maritime Antarctic

This thesis concerns organized and independent tourism, where the method of travel is by ship or small vessel (*e.g.* yacht). Flights do not pertain to this study.

Organized commercial Antarctic shipborne tourism began in 1958-59, and became regular in 1966 (Codling, 1995: 167; Reich, 1980). By the end of the 1998-99 tourist season, approximately 86,664 (Figure 1.1) tourists have visited landing sites in Antarctica (Enzenbacher, 1992, 1994; IAATO, 1998)[1]. More than half of these have been during the last five years. Although these figures may seem small compared with tourist visits to some British villages (Crosbie, 1998: 2), the number of Antarctic tourists have tripled in the last ten years (1989-99), and larger increases are predicted. The numbers of tourists visiting the Antarctic every year, since 1990-91, is greater than the number of scientists and logistic staff (Hall and Johnson, 1995:9). During this period, voyages to the Maritime Antarctic in smaller vessels, or yachts

[1]The figures are approximate, as they have been compiled from several sources: (a) 1957-58 to 1992-93 totals are from Enzenbacher (1992: 142, 1994: 105) and may contain non-shipborne figures, (b) 1993-94 to 1997-98 totals are from International Association of Antarctic Tour Operators (IAATO) as reported to the NSF (IAATO, 1998), (c) total from 1998-99 are projected figures by IAATO (IAATO, 1998).

have accounted for approximately 2% of the total visitors. These figures are difficult to record, but have been compiled from various sources by Headland (1998: 57). However, it is obvious that the numbers are increasing steeply (see figure 1.2).

During this growth, shipborne tourism has largely been a self-regulating industry with self-imposed Guidelines and Codes of Conduct. Visitors from private expeditions were relatively few. Tourism came under the regulations of the Protocol when these came into force, 14 January 1998 (Richardson, 1998: 147). This created problems with various interpretations and perceived ambiguity of the Protocol, as well

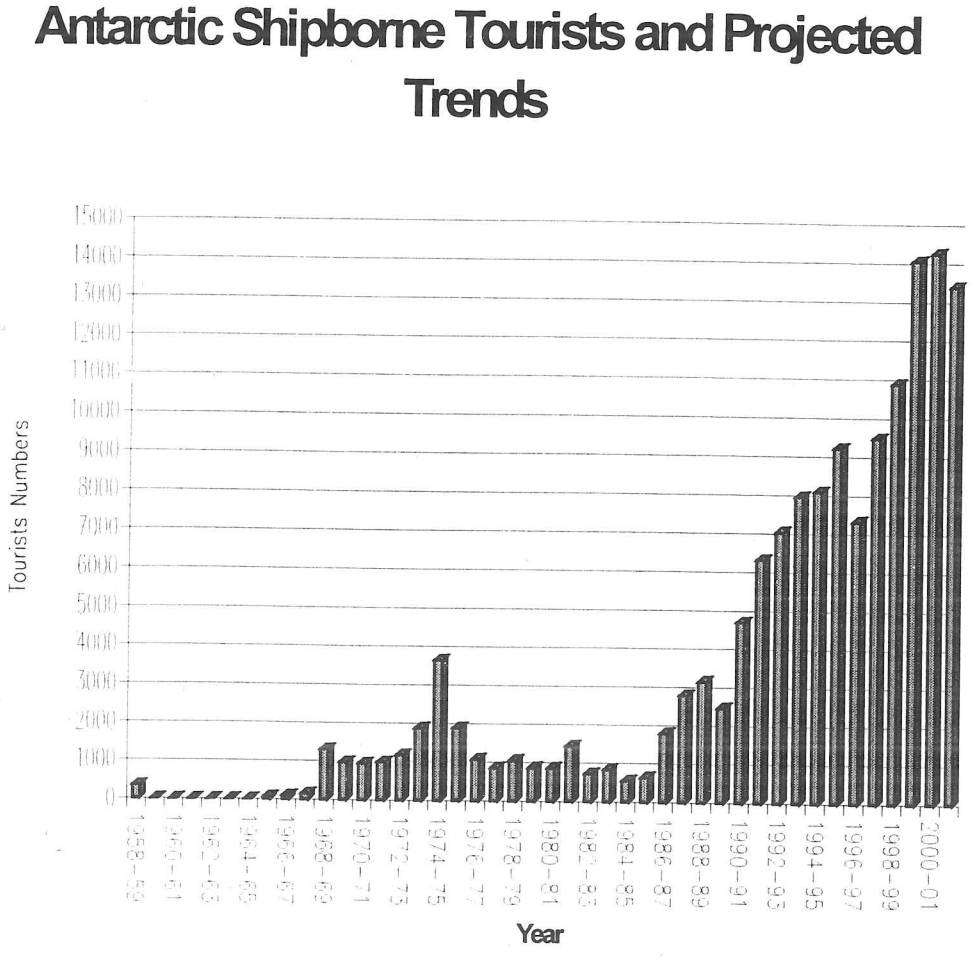


Figure 1.1 The graph shows the approximate number of shipborne tourist that will have visited the Antarctic from 1958 to 2002. Source: Enzenbacher (1992: 142, 1994: 105) and IAATO (1998). Figures for 1998-2002 are predicted by IAATO (IAATO 1998).

as difficulties of enforcing the regulations (see section 2). Tourists numbers for each of the two seasons of 1999-2000 and 2000-2001 are estimated to be over 14,000 (IATTO, 1998). The increase in tourist numbers could also cause more cumulative effects on landing sites. The introduction of new tour operators with little or no knowledge of the regulatory requirements or conservation measures could similarly have adverse consequences. Currently, there is no practice of managing or monitoring such effects of increasing tourism.

1.4 Tourist landing sites

A comprehensive account of seaborne tourist activities was given in Crosbie (1998: 55-60). However this study is primarily concerned with those activities which occur during landings.

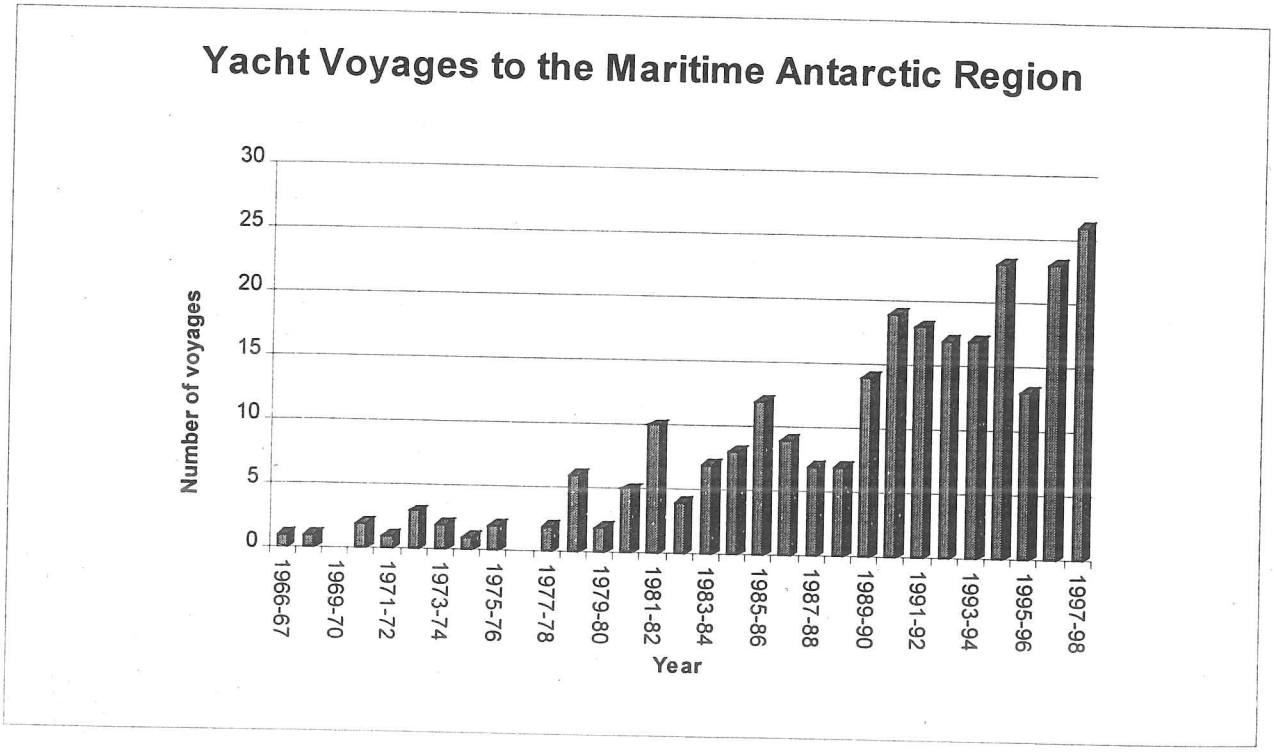


Figure 1.2 The approximate number of yacht voyages from 1966-67 to 1997-98. Source: Headland (1998).

Tourists generally reach the shore aboard small craft (*e.g.* rubber inflatable). The boats are usually pulled up and left on the beach for the duration of the landing that generally lasts a couple of hours (see photo 1.1). During their time ashore, as many as 100 tourists will walk around, observing and photographing the wildlife and intrinsic beauty of the area, historic structures and other points of interest. They may walk several hundred metres in different directions, or spend most of their time close to the landing point. During this time they may come in close contact with the plants and animals, and items or structures of historic or cultural significance. This is where tourists may be responsible for adverse environmental effects.

The various environmental problems (Table 1.1) that may be associated with tourism activities vary and may be caused by several factors. These are:

a) type of method and activity,
b) time spent in a particular area,
c) number of tourists involved,
d) environmental and cultural awareness of the tourists,
e) the adherence to regulations, or guidelines.
f) cumulative effects from multiple visits.

The degree to which these factors affect the environment depends on the environmental hardiness and regeneration properties. If an environment has been damaged by an activity, but is able to regain its original state after an acceptable time, then it is generally regarded as sustainable. Where areas are visited frequently, the cumulative effect might alter those properties, and have undesirable consequences.

Additionally there are different seasonal and climatic periods when a particular environment is more vulnerable to damage (*e.g.* breeding or molting animals, and vegetation under light snow cover.).

The slow regenerative properties of most Antarctic biota make them particularly susceptible to the activities of tourism. Additionally, sustainability to tourism activities might vary season to season, or even several times within a season. Therefore, as larger numbers of tourists arrive and their activities increase, progressive thinking should be applied to the *future* sustainability of the environment (Stonehouse, 1998).

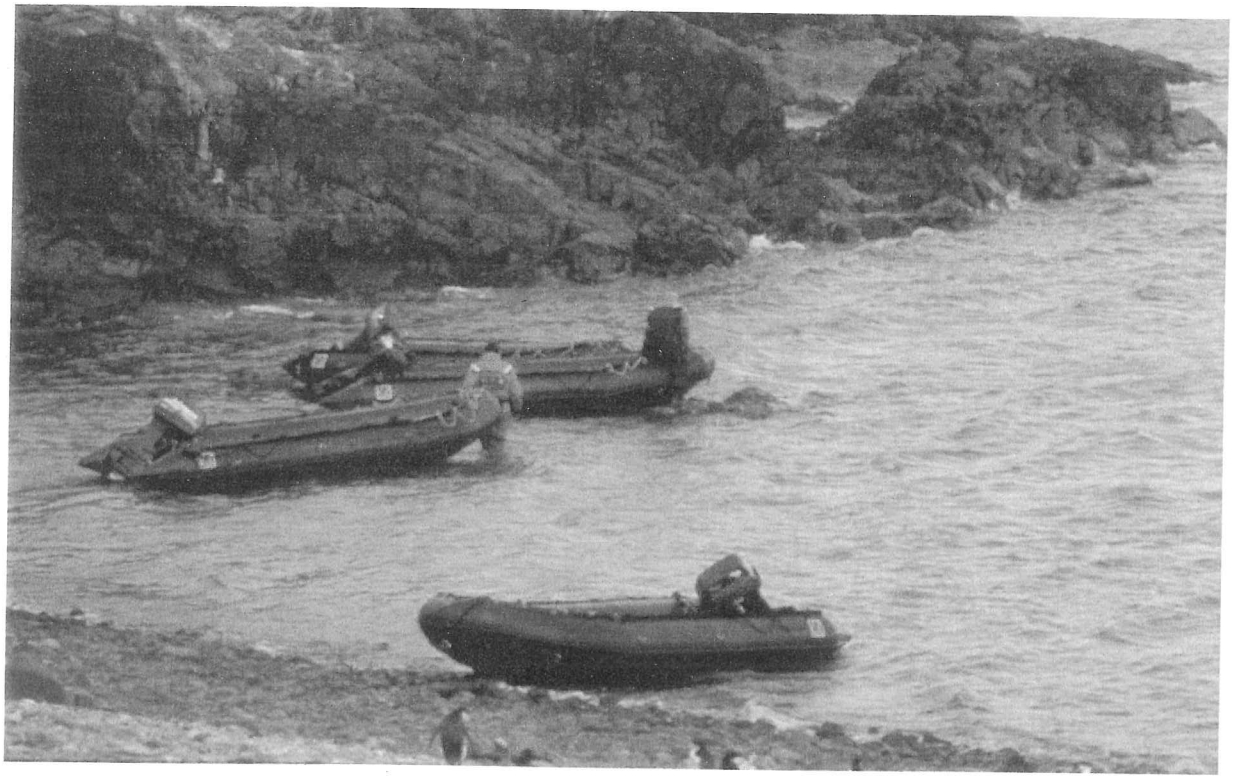


Photo 1.1 Small inflatable boats (zodiacs) used to take tourist ashore. Note one boat on shore, while other two are anchored offshore to allow easy access for the animals. Source; Author.

Potential impacts from tourist activities

Impacts from shore-based activities	Description
Scientific	damage or interference with scientific research
Cultural	removal or damage to items of historic or cultural significance
Physical	Littering Graffiti removing fossils or minerals creating trails from constant use reduces aesthetic value may affect local hydrology
Ecological	disturbance to vegetation disturbance to bird colonies affects breeding success recruitment of new breeders affects predator/prey relationship spread of pathogens introduction of alien species

Table 1.1 Crosbie (1998: 86) lists the potential impacts, in general terms, from shipborne tourism. This information was compiled by IAATO and submitted in the form of an Initial Environmental Evaluation (IEE) to the US Environmental Protection Agency (EPA) which is the governing authority for Antarctic tourism operation in the US.

1.5 Needs for management

There is no protective status, management objectives, or restrictive measures to limit visitors to sensitive landing sites in the Maritime Antarctic, yet these conservation measures are common elsewhere in the world (Stonehouse, 1998: 55).

Chapter four evaluates six different wilderness areas, representing six different countries, that all deal with seaborne tourism in polar regions. All identify effects of tourism as a reason for developing management strategies that include objectives, protection and enforcement methods, and monitoring programs. Yet, although the number of sites visited annually continues to increase in the Maritime Antarctic, they are unmanaged and the cumulative effects remain incompletely known (Crosbie, 1998; 110).

This thesis also discusses the reasons for this, and investigates the possibility of principles from similar recreational-wilderness plans, used elsewhere in the world, being implemented in the Maritime Antarctic.

1.6 Aims and objectives of the thesis

The principal aim of this thesis is to propose a method that will enable adverse effects of tourism to be significantly mitigated by implementing mechanisms provided for by the ATS. The major objectives are:

- to demonstrate that growing numbers of visitors to the Maritime Antarctic are a potential threat to scientific research and the ecological status of tourist landing sites. The primary adverse impact could be caused by cumulative visits, and non-compliance with various obligatory and hortatory rules and Guidelines.
- to elucidate the regulatory and hortatory requirements pertaining to tourism and indicate that these are insufficient to ensure effective conservation at tourist landing sites.
- to determine whether the Annex V Area Protection and Management System is a method which can effectively incorporate and enforce those requirements by a management plan.
- to determine whether an effective method of managing the effects of tourism is

possible under the ATS.

- to evaluate other recreational wilderness regions to identify common criteria within the management plans.
- to explain a management plan for an Antarctic Specially Managed Area, and whether the ATS requirements and lack of sovereign authority allow it to be an effective plan.
- to develop and recommend a management plan which would be effective and capable of meeting the criteria necessary for acceptance as a model for a uniform format.
- to evaluate Deception Island for implementation of a model plan.
- to implement the model plan at Deception Island to indicate its effectiveness.

Chapter 2

Regulatory requirements for managing seaborne tourism

2.1 Introduction

The first chapter described the Maritime Antarctic and seaborne tourism within it. Resources, and threats to their sustainability from tourist activities, were discussed. This presented the physical and practical need, and environmental desiderata, for management of tourist landing sites.

This chapter explains the existing obligatory and hortatory requirements for management of tourist landing sites; measures that have evolved through the years in response to changes in tourist patterns and to continual improvement of existing strategies (Johnson, 1997).

There are two primary controlling factors that regulate seaborne tourism in the Maritime Antarctic. The First is the Antarctic Treaty System (ATS) and its various instruments, Second is IAATO principles.

The Antarctic Treaty and its associated instruments which form the ATS, are the single most important control of tourist activity in the Maritime Antarctic (Joyner, 1998). The Protocol is changing the way in which tourism activities may be conducted (Davis, 1996); which are also subject to International regulations (e.g. MARPOL, SOLAS, IMO, etc.) and national laws applying to specific countries and persons. Non-governmental organizations (NGOs) (e.g. SCAR and ASOC), and increasing popularity and attention drawn to Antarctic tourism, attracts public scrutiny which engenders attention of the tour operators (Andrew Prossin, pers com.; pers obs). The regulatory influence of these will be discussed.

In addition to the external factors regulating tourism, IAATO members conduct their operations by internal, self-imposed Guidelines and Codes of Conduct. This chapter elucidates the regulations, rules, Guidelines, recommendations, and Codes of Conduct, which influence tourist activities.

2.2 The Antarctic Treaty's influence on tourism management

Although a form of shipborne tourism was operating in the Maritime Antarctic as early as 1924 (Headland, 1989; Headland, 1994), it was not until 1958-59 that regular private commercial tourism began (Codling, 1995: 167; Reich, 1980). The numbers of shipborne tourists have been recorded since 1958-59 (Enzenbacher, 1992:142; Enzenbacher, 1994: 105). This coincided with the origin of the Antarctic Treaty that was negotiated 1 December 1959, and came into force 23 June 1961 at the first Antarctic Treaty Consultative Meeting (ATCM I, 1961).

The original Antarctic Treaty is a document with fourteen Articles (Appendix 1). The first Article states that *Antarctica shall be used for peaceful purposes*, a statement which could be interpreted as securing the freedom of movement and activities, including tourism, throughout the Treaty area (Joyner, 1998: 218). Although research is accepted as the preeminent activity, there is nothing to invalidate tourism as fully acceptable (ibid.: 218).

Although the Treaty and commercial tourism began at approximately the same time, the Treaty did not deal specifically with tourism until the fourth Antarctic Treaty Consultative Meeting (ATCM IV) in 1966. The concern of ATCM IV was: *the effects of tourists activities may prejudice the conduct of scientific research, conservation of flora and fauna and the operation of Antarctic stations* ... (ATCM IV, 1966). ATCM IV-Recommendations 27 was; *advance notice through diplomatic channels, be given before tourists visit scientific stations*. This recommendation, was the first attempt to regulate tourism. It is also clear that, even though the conservation of flora and fauna is mentioned as a concern, it is not from an environmental view, but mainly to protect scientific research from tourism (Stonehouse, 1992: 79).

Tourism was mentioned again at ATCM VI (1970) as being likely to have: *lasting and harmful effects on scientific programs, Antarctic environment, particularly in Specially Protected Areas, and on Historic Sites* (Heap, 1990: 2602). An opportunity for regulating tourism emerged in ATCM VIII (1972) with Recommendation 9: *tourism is a natural development in this area and that it requires regulating ... and requests all organizers of tourists groups, except in emergencies to land only within the areas of Areas of Special Tourist Interest* (ASTI) (Heap, 1990: 2602-2603). However, ironically, no ASTIs have ever been designated. The opportunity to initiate *effects and monitoring by long term studies appears to have*

been ignored, an omission representing many missed opportunities for research. (Stonehouse, 1992: 80).

Attempts were made between ATCM XVI (1990) and ATCM XVII (1992) to establish a separate Annex in the Protocol concerning tourism (ATCM XVII WP-1, 1992). However no satisfactory models emerged and the issue was subsequently dropped. Although the ATCPs have expressed the need for restricting the large number of places where tourists land so that the ecological effects may be monitored (Heap, 1994; Elliott, 1994: 78; Stonehouse, 1998: 50), no attempt has been made since ATCM XVII to do so.

Enzenbacher (1995: 180) states that the: *ATCP have claimed for themselves the responsibility for ensuring human activities, including tourism, are conducted in a manner consistent with the principles of the Treaty and its instruments and to provide appropriate, comprehensive and effective regulation.* However, these regulations are designed to regulate human activities, but they do not address the question of how to manage the land they use.

Heap and Holdgate (1986: 195) state their bureaucratic approach to the Treaty that reflects a certain naivete: *the Antarctic Treaty System is a management tool that regulates human activities by international consensus.* This may be true for the ATCPs who are obliged to follow the Treaty, however there are no guarantees of compliance by visitors from countries not belonging to the Treaty, or those unaware of the ATS regulations.

2.2.1 The Protocol's regulatory influence on tourism management

The Protocol has been described as being the most comprehensive multilateral document on the international protection of the environment ever adopted. Where the Treaty assures tourist freedom to visit Antarctica, the Protocol regulates their activity (Blay, 1992).

The Protocol covers the activities of all visitors including tourists, but impartially includes scientists and logistic staff on national expeditions as well as members of non-governmental parties (Stonehouse, 1998), and only binds citizens of the Protocol (see Appendix III).

All activities, including those of tourists are subject to the Protocol and its Annexes. They are to be assessed by an Initial Environmental Evaluation (IEE), to determine the effects they may have on the environment. This is a critical step, for it is the IEE that determines whether, or how, tourist activities may proceed.

2.2.2 The Initial Environmental Evaluation (IEE) as a requirement for managing tourist activities

The application of environmental assessments to human activities in Antarctica arose from a study published by Benninghoff and Bonner (1985). The authors consider that their approach provided general procedures for evaluating environmental effects of such activities on the Antarctic (ibid.: 4). However, consideration of commercial or non-scientific activities was specifically excluded. Benninghoff and Bonner (1985) drew no distinction between activities of scientists at research stations and tourists at landing sites (Lyons, 1993: 112).

Annex I of the Protocol provides rules for prior assessment of environmental impacts of proposed activities. It requires a Preliminary to determine whether an activity will cause less than a minor or transitory impact. If a minor or transitory impact is determined, then a Initial Environmental Evaluation (IEE) is required.

If an activity is judged to cause a minor or less than minor or transitory impact, then the activity is free to proceed. If not, then a further and more revealing evaluation, called a Comprehensive Environmental Evaluation (CEE), must be conducted and submitted to the ATS.

One problem lies in the ambiguity of the term *minor or transitory,* which is clearly left open to interpretation of convenience (Peter Clarkson, pers con). Although ATCPs have tried to clarify this problem with various working group studies and information papers, confusion and variable interpretation persist (ATCM XXI WP-35; ATCM XXI WP-36; ATCM XXI IP-20; ATCM XXI IP-74; ATCM XXI IP-80; ATCM XXI IP-97).

Another problem arises from the origins of the IEE. Benninghoff and Bonner (1985) proposed that an independent reviewer or advisory panel should write the IEE, and Lyons (1992: 115) also agreed by stating: *The entire credibility of the exercise is at stake if it is carried out entirely within the group proposing the activity.* However

the ATCPs did not agree, and allow the group conducting an activity to prepare its own IEE, which is described by Hansom and Gordon (1998) as *rubber-stamping*

The submission by IAATO of a single IEE representing activities of its members at all landing sites in Antarctica, to US Environmental Protection Agency (EPA) is a case in point. IAATOs conclusion that the activity of shipborne tourism had a minor or less than minor or transitory effect on the environment was accepted, apparently without question, and tabled as Information Paper 74 at ATCM XXI, 1997 (Crosbie, 1998: 78). That the EPA would accept this is surprising through its statement on the subject: *The EPA is strongly committed to minimizing excess paperwork and to implementation of these interim final regulations such that undue burden is not placed on the operators* (US EPA, 1997). This goes some way towards clarifying its position. IAATOs submission implies unrealistically that tourism affects every site in the same manner, and to the same degree, regardless of the number of people involved on a landing, possible cumulative effects, or different environmental sensitivities of sites. This also ensures that tourism maintains the freedom it enjoyed before the Protocol came into power (*e.g.* choice of sites; activities conducted at those sites).

The fact that a national party (US), SCAR, and the ATCPs accepted IAATOs submission, shows an extremely liberal interpretation of *minor or transitory,* and questions the validity of the entire system.

2.2.3 International regulations and the problems of enforcing national laws

Tour operators need to be aware of, and comply with, various International regulations that apply, primarily, to all ships. Since this thesis is concerned with shore-based activities of shipborn tourists, these regulations are not pertinent to this study.

By ratifying the Protocol, all ATCPs have shown a commitment to enact domestic laws in their own countries (Richardson, 1998). Thus, breaches of the Protocol and its Annexes are now punishable under national law. Examples of different national laws for the Protocol, are:

(1) the US *Antarctic Conservation Act* (ACA) of 1978 (1995), allows fines of up to $10,000 US or one year imprisonment for convicted offenders (ACA,

1995: 182).

(2) the British *Antarctic Act of 1994*, allows fines of up to £5,000 or two years imprisonment, or both (Antarctic Act, 1994: 8).

(3) the *New Zealand Antarctic* (Environmental Protection) *Act, 1994*, which allows fines up to $100,000 (NZ) and one year imprisonment (Ministry of Foreign Affairs and Trade, 1998: 11, 30).

The NSF engaged independent observers who traveled aboard several tourist vessels during the 1991-94 seasons to report infractions. They had little power to enforce the law only being able to report infractions ... and then only for US citizens (Kiernan, 1993). Only a few minor and unintentional infractions were reported (ibid.).

During 1993, approximately 1,200 tourists visited the US station, Palmer. A ranger was employed with law enforcement powers, which were limited to US citizens (Mervis, 1993). The same year, NSF announced that the position of an Antarctic Conservation Act Officer had been filled who will be empowered to issue citations for violations by US citizens (Enzenbacher, 1993).

In an area which is outside of the Maritime Antarctic, it has become an established practice for tour operators to carry an official observer while visiting the New Zealand Territory of the Ross Dependency (Dingwall, 1998). This is potentially less complex because the Ross Dependency is not subject to dispute in the manner of the Antarctic Peninsula and region; recognition of the Ross Dependency is, however, not universal (Headland, pers. com.). The observer endeavors to ensure compliance with the protocol, management plans, and permits, and is empowered to charge individuals for any violations (ibid.). However there are presently no assigned enforcement officers at tourist landing sites in the Maritime Antarctic (pers. obs.). The ACA has designated individuals as enforcement officers. However a precedent of working with tour operators is not a common practice (pers. obs.). The author has participated in approximately 300 tourist landings from 1994 to 1999 in the Maritime Antarctic, and has never encountered anyone empowered with enforcing national laws, with the exception of those at national stations.

It is not only the tourist who must comply; all activity of citizens that belong to one of the 26 ATCP falls under the Protocol. This, however, is the vast majority of persons who visit the Antarctic in any capacity.

The ship's captain may have limited powers of enforcement, but these are discretionary and unlikely to be exercised since the captain usually remains aboard the

vessel during landings.

The tour operators provide voluntary enforcement, but have few powers should an infraction occur. IAATO tourists have assumed, in most cases, the role of ambassadors to the Antarctic thus complying with, and enforcing the regulations and Guidelines among themselves (pers. obs.). Although this has worked fairly well to date, any increasing numbers of non-IAATO tourist-operators could make this more difficult to ensure in the future.

2.2.4 Influences of non-governmental organizations on tourist management

Article 13 of the Antarctic Treaty allows any country belonging to the United Nations, or any other invited state, to accede to the Antarctic Treaty. To become a voting member the country must become a Consultative Party (Treaty Article 9-2). Although an attempt was made by the NGO, Greenpeace, to acquire voting privileges by setting up a base and conducting research, this was not accepted by the ATCPs.

There are no NGOs with voting privileges, although some have been granted *observer* or *expert* status at Consultative meetings. This may give them observers significant influence, experts less so.

2.2.4.1 Scientific Committee on Antarctic Research (SCAR)

The most prominent Antarctic NGO is SCAR (Clarke, 1994), which is the link between the ATCP and the scientific committees, and coordinates scientific activities within the ATS (ibid.). The ATCP consider SCAR to be the principal advisor for any scientific issue that needs to be considered (Galimberti, 1991). The powerful influence SCAR possesses, is shown by the reluctance of the ATCP to take any *recommendatory action on any issue which relates to what is done or not done in the Antarctic without first seeking the views of SCAR* (Heap, 1988: 22).

SCAR works indirectly through other committees and organizations. Under Article 11 of the Protocol, the Committee of Environmental Protection (CEP) was established to provide advice and recommendations about the Protocol for the ATCPs. Article 12-2 of the Protocol requires the CEP to consult SCAR for anything with a

scientific, environmental or technical relevance. ATCM XIX (1995) directed working groups to investigate ways in which CEP could:

(1) identify sites disturbed by tourist activities,

(2) determine indicator variables likely to be sensitive to tourist activities,

(3) evaluate means to minimize impacts of activities.

Additionally, IEEs from tour operators, applications for designating protected areas, and submissions of management plans (discussed below) must go through the CEP. It is then SCAR that recommends approval, or otherwise. SCAR then returns the recommendation to the CEP, which present it to the ATCMs. Thus, SCAR has the power of advising the ATCM to allow or prohibit tourist activities before they begin.

2.2.4.2 Antarctic Southern Ocean Coalition (ASOC)

A second influential NGO is ASOC (Clark, 1994), which claims to represent over 200 other NGOs with interests in environmental and wildlife issues, among others. Its objective is to provide ideas and alternative proposals to the ATCP, organizations participating in activities in the Antarctic, and *to clarify issues to the media* (ibid.:162). In this capacity ASOC hopes to enhance the awareness of all participants (ibid.).

An additional factor of influence is the recognition of expert status given to ASOC, by the ATCP. The network of expertise and resources from the NGOs represented has resulted in the acceptance by the ATCPs of their potential for constructive contributions (Herr and Davis, 1992).

A tour operator needs to ensure that activities are conducted in a manner acceptable to most of the NGOs represented by ASOC. Therefore, ASOC is not a regulatory body but has an un-definable influence that is un-measurable.

2.3 The role of International Association of Antarctica Tour Operators (IAATO) in tourism management

It is uncommon for tourists to be concerned with managing the land they use, elsewhere in the world, but they may be obligated to follow Guidelines or regulations

imposed by the managers of the land. In the absence of specific regulation of Antarctic tourism by the ATS a group of Antarctic tour operators founded their own regulatory body in 1991, IAATO (Chaturvedi, 1996, IAATO, 1998). As a group, they anticipated the need to incorporate a comprehensive guideline system for management of their activities, pre-dating the efforts of the ATS to manage them.

The *Guidelines* and *Codes of Conduct* of IAATO, neither of which are defined as regulatory measures, were later incorporated into a formal recommendation at the ATCM XVIII, which is a regulatory instrument. Although IAATO then accepted the modified recommendations of their original version, these were not thought to be sufficiently comprehensive by many persons in the industry, therefore some expedition leaders employ stricter self-imposed measures (Crosbie, 1998; Stonehouse, 1998; pers obs.).

IAATO members are required to conduct their activities and ensure their tourists are aware of the Guidelines and Codes of Conduct. The Code of Conduct requires that, 75% of their staff have Antarctic experience, no more than a hundred people are allowed ashore at a time, and there must be at least one guide for every twenty tourists. These help the guides recognize and avoid any adverse environmental effects. All the tourists are instructed in the Guidelines and Codes of Conduct and have a tendency to enforce them amongst each other (per. ob.). Furthermore, for the longer term, it is in IAATOs best interest to maintain a sustainable environment in which to operate.

However, these Guidelines and Codes of Conduct are arbitrary regulations. They are applied to all landing sites, and do not take into account the various sensitivities discussed in section 1.4. Additionally, they may be interpreted differently by those implementing them. Although IAATO members are required to implement these regulations, non-IAATO members that land tourists at the same sites, may not have knowledge of the Guidelines and Codes of Conduct.

2.4 Summary and conclusions

Under Article 1 of the Antarctic Treaty, tourism enjoys the same freedom as any other human activity in the Antarctic, and is recognized as an acceptable activity. Tourism has been a self-regulating industry that operated under the Guidelines of the ATS.

Although tourism still enjoys a strong element of freedom, it must now comply with the *regulations* of the Protocol. However, the adoption of a legally binding instrument is not "itself" sufficient to ensure the effectiveness of its regulation (Pineschi, 1996).

The Protocol, which applies to all activities including tourism, requires tour operators to complete IEEs of their intended activities. However, two critical problems reduce its effectiveness:

(1) the ambiguous interpretation of the process; and

(2) evaluations conducted by the instigators of the activity

The CEP will be investigating tourist activities and effects, and NGOs like SCAR and ASOC will be utilizing their influence and public pressure to ensure compliance, however they presently have an un-definable influence.

IAATO could continue to operate in the same manner with its self-imposed Guidelines and Codes of Conduct, while operating under the regulations of the ATS, but this is unlikely to be effective for the long term. Chapter one explained that increasing numbers of tourists and tour operators are predicted to visit Antarctica who may not all belong to IAATO. Additionally, the various mechanisms that provide regulations, do not provide a means of enforcing them.

Both the ATS and IAATO are concerned with controlling the activities of people. This contrasts with other wilderness areas in the world that are concerned with managing the need of the land (see Chapter 4). Therefore, what is needed to implement the regulations, Guidelines, and Codes of Conduct is a method for managing the land.

The inability to manage individual landing sites could be interpreted as a deficiency of the ATS that may be rectifiable, by the Protocol. The next chapter discusses a method provided in Annex V of the Protocol that offers the opportunity to manage tourist-landing sites.

Chapter 3

Evaluating the Annex V Area Protection and Management System (APMS) for managing tourist landing sites

3.1 Introduction

Chapter One discussed the threat that tourist activities may pose to the environment, and their possible interference with research. The environmental and regulatory requirements needed to resolve these problems were indicated in Chapter Two

This chapter examines the Area Protection and Management System (APMS) of Annex V as a method of managing the land where tourist activities occur, incorporating the requirements previously discussed. Annex V of the Madrid Protocol[1] (Appendix II) provides two types of protected areas (Table 3, and Appendix II): Antarctic Specially Protected Area (ASPA) and Antarctic Specially Managed Area (ASMA).

The APMS is investigated to understand its limits for managing tourist landing sites and identify any inherent or anticipated problems.

Characteristics of ASPA and ASMA designations are discussed to determine whether either, or both, would be suitable to effectively serve the management requirements of tourist landing sites.

3.2 Role of protected areas in the objectives of the ATS

The ultimate objective of the Treaty as an environmental mechanism is the harmonization of utilitarian, conservation, and aesthetic values (Heap and Holdgate, 1986: 195; ATCM X, 1979:78). One of the methods that the ATS has adopted to accomplish this is through the designation of portions of the region as protected areas (Clark and Perry, 1996: 296).

[1] The Protocol came into force 14 January, 1998. Annex V is not yet in force, but ratification is expected in the near future (Hansom and Gordon, 1998; M. Richardson, and P. Clarkson, pers com).

Designation	Antarctic Specially Protected Areas (Article III)	Antarctic Specially Managed Areas (Article IV)
Objectives (Article II)	For the purposes set out in this Annex, any area, including any marine area, may be designated as an Antarctic Specially Protected Area or an Antarctic Specially Managed Area. Activities in those areas shall be prohibited, restricted, or managed in accordance with Management Plans adopted under the provisions of this Annex	
Description	Any area including any marine area, may be designated as an Antarctic Specially Protected Area to protect outstanding environmental, scientific, historic, aesthetic, or wilderness values or combination of those values, or ongoing or planned scientific research.	Any area, including any marine area, where activities are being conducted or may in the future be conducted, may be designated an Antarctic Specially Managed Area to assist in the planning and co-ordination of activities, avoid possible conflicts, improve co-operation between Parties or minimize environmental impacts.
Mgmt. Plan	Mandatory	Mandatory
Access	Entry into an Antarctic Specially Protected Area shall be prohibited except in accordance with a permit issued under Article VII.	Entry into an Antarctic Specially Managed Area shall not require a permit.
Specific Objectives	The Parties shall seek to identify, within a systematic environmental-geographical framework, and to include in the series of Antarctic Specially Protected Areas: (a) Areas kept inviolate from human interference so that future comparisons may be possible with localities that have been affected by human activities; (b) representative examples of major terrestrial, including glacial and aquatic, eco-systems and marine eco-systems; (c) areas with important or unusual assemblages of species, including major colonies of breeding native birds or animals; (d) the type locality or only known habitat of any species; (e) areas of particular interest to ongoing or planned scientific research; (f) example of outstanding geological, glaciological, or geomorphological features; (g) areas of outstanding aesthetic and wilderness value; (h) sites or monuments of recognized historical value; (I) such other areas as may be appropriate to protect the value set out in description above.	Antarctic Specially Managed Areas may include: (a) areas where activities pose risk of mutual interference or cumulative environmental impacts; and (b) sites or monuments of recognized value.
Re-configuration and Multiple-use	Specially Protected Areas, and Sites of Special Scientific Interest designated as such by past ATCMs are hereby designated as Antarctic Specially Protected Areas and shall be re-named and re-numbered accordingly.	An Antarctic Specially Managed Area may contain one or more Antarctic Specially Protected Areas, entry into which shall be prohibited except in accordance with a permit issued under Article VII.

Table 3.1: Comparison between Antarctic Specially Protected Areas (ASPA) and Antarctic Specially Managed Areas (ASMA), under The Madrid Protocol, Annex V , Articles 2, 3, and 4.

3.3 Annex V APMS designations

Annex V provides for two designations in its APMS (Table 3.1). The fundamental difference between the two designations is described below.

3.3.1 Characteristics of an ASPA

ASPAs are designed to protect *outstanding environmental, scientific, historic, aesthetic or wilderness values, or ongoing or planned research* (Annex V Article 3). Entry into an ASPA is prohibited except in accordance with a permit under Annex V, Article 7 (see Appendix 1).

ASPAs will incorporate all previous Specially Protected Areas (SPAs) and, Sites of Special Scientific Interest (SSSI). Under the previous guidelines, entry into some of these areas was prohibited except for *compelling scientific purposes that could not be served elsewhere* (Foreign and Commonwealth Office, 1997). Thus, entry by tourists was prohibited.

Heap (1994:2082) states that: *The ASPA permit system is the best means of ensuring protection where direct oversight management is not possible. Where such management is possible, Article 8 provides the possibility of designation of ASMA.* Therefore, it would appear that the protected areas were designed for their method of protection, rather than the values they are intended to protect. In the case of an ASPA, the method is passive management.

Article 3e of the Protocol requires regular and effective monitoring to facilitate early detection of any adverse effects within the area. It would not be possible to comply with this if tourist activities were allowed within an area without active management. Thus it would appear that an ASPA is not appropriate to regulate tourism.

However, the management plan (Annex V, Article 5) *is the blueprint of the individual protected area* (Clark and Perry, 1996: 313). Article 2, states that activities in ASPAs and ASMAs shall be prohibited, restricted, or otherwise managed in accordance with the plans adopted. New Zealand has focused on this point with submissions, which have been adopted for three frequently visited tourist sites (Cape Royds Historic Site, Hut Point Historic Site, Cape Evans Historic Site), designated as

SPA[2] (SCAR, 1998; ATCM XXII, 1998; AHT, 1997: 2). As soon as Annex V comes into force, the SPA would automatically become an ASPA, under Article 3 , paragraph 3. New Zealand's management plan proposes daily (active) management of the site, and allows a few thousand tourists to visit in a season. The reasons for issues of permits are generalized, but they may include: *activities related to tourism, educational or recreational activities provided they do not conflict with the objectives of the plan* (AHT, 1997: 39). The numbers of permits distributed are specified by the note that: *Parties operating in the Ross Sea area shall consult together and with groups and organizations interested in visiting the site to ensure that visitor numbers are not exceeded* (AHT, 1997: 39). Although this has been accepted by the ATCPs, this appears to be a unique application for this designation.

Thus, an ASPA appears to have been designed to operate with passive management, which might not be suitable for a tourist-landing site, in accordance with Article 3d. However, New Zealand has demonstrated that ASPAs could be applied to regulate activities at tourist landing sites, but only if there is active management provided.

3.3.2 Characteristics of an ASMA

ASMAs are designed to protect *activities, and to assist in the planning and co-ordination of activities, avoid possible conflicts, improve co-operation between Parties or minimize environmental impacts* (Annex V Article 4). Entry to an ASMA does not require a permit. Unlike an ASPA, an ASMA is intended to operate with active management. It has also been determined that active management of tourist activities is necessary to comply with the Protocol.

The primary problems of environmental effects from tourism are described in Annex V, Article 2b: *that may include areas where activities pose a risk of mutual interference or cumulative environmental impacts.* Although Annex V of the Protocol makes no specific mention of tourism, the activities that Article 2b is designed to protect, are similar to those involved during tourist landings. Management is the

[2] Two other submissions for SPA designated sites (*e.g.* Cape Adare and Cape Lewis) have been adopted by the ATS, but they are infrequently visited by tourists and do not have active management present

method of implementing an action or measure, and regulation is the action or measure, that is to be implemented. For regulations to be effective, active management is necessary to comply with, and enforce, the measures (Johnson, 1995). Bonner (1992) and Benninghoff and Bonner (1985) state that: *Passive management based solely on restrictive* (regulatory) *measures is now wholly recognized as inadequate for fulfilling the objectives of conservation management* Thus, active management would best serve the regulations applied to tourist activities at a landing site.

3.4 Problems facing the new APMS

This section discusses some of the problems that may be encountered by designating a tourist-landing site as an ASPA or an ASMA.

1) The APMS of the *Agreed Measures for the Conservation of Antarctic Flora and Fauna* was originally designed to protect scientific research, and flora and fauna. Annex V now includes intrinsic, aesthetic and wilderness values as well. The last two are un-measurable, and subject to vastly differing interpretations. This makes it difficult to protect, or determine if the protection is effective.
2) Although the Protocol requires all former; SSSIs, SPAs, and Multiple-use Planning Areas (MPAs) have revised management plans for their new Annex V designations, there is no mechanism to ensure this is done. Conversely, there are actually provisions to accommodate those that do not have them (Annex V, Article 7 paragraph 2)! Since the designation, protection, and use of the site is determined by its management plan, it is probable that there will continue to be SPAs operating under the previous pre-Protocol Protected Area System, but renamed according to the Annex V system

   Similarly, if a revised management plan is not submitted for a previous SPA, for its new designation as an ASPA, then the appropriate party may issue permits for *compelling scientific purposes which can not be served elsewhere, and which will not jeopardize the natural ecological system in that area*. This is the same procedure as the previous system, and does not necessarily fit the designed intentions of the new APMS. If these situations were to occur, it would confuse and dilute the designed intentions for the Annex V APMS. This could reduce the

effectiveness for the correctly designated areas.

3) There is no provision in the Protocol for any single authority to make critical management decisions, as in the case of Article 3, paragraph 4b of the Protocol which states: *the activities will be modified, suspended or canceled if they result in or threaten impacts upon the Antarctic environment*. The National Party responsible for proposing a protected area is responsible for the protection of that area, which amounts to self-regulation. Although this is not ideal for effective protection of natural areas, it is the reality of Antarctic politics (Clark and Perry, 1996). A solution could be to establish an independent organization to make management decisions, but the history of establishing a secretariat for the ATS indicates this might be a difficult and prolonged process even if it were possible.
4) There have been instances of poor compliance within the APMS, which illustrates the lack of enforcement capabilities. The World Conservation Union suggests a compliance assessment on three levels (De Pooter and Dalziell, 1996);
    a) ATS inspections;
    b) national authority over its citizens or;
    c) operator commissioning or conducting an audit.

    The first suggestion of ATS inspections is unlikely because inspection teams have been unable to conduct more than an average of only 5.4 inspections annually on bases and ships since 1963 (Mike Richardson, pers com), and any extra burden of inspecting protected areas would be difficult. The second option would basically make the protected area self-enforced, which would not be ideal, as discussed in paragraph 3 (this section). The third option would be the most effective if the site was managed by an independent organization (*e.g.* Project Antarctic Conservation; Oceanites; Antarctic Southern Ocean Coalition).
5) Costs of management and monitoring programs will be expensive. It is doubtful that the ATP would pay for the management of a tourist site designated as an Annex V APMS. The cost incurred would have to be born by the National Party proposing the designation, the tour operator, IAATO, or the tourist. Furthermore, there is presently no ATS secretariat or means to administer funds equitably, should any become available.
6) By designating more protected areas, it might increasingly restrict access and thus curtail freedom of scientific research throughout the region (Harris, 1994). This could be interpreted as being against the spirit of the Antarctic Treaty System,

which is dedicated to *freedom of scientific investigation* (Antarctic Treaty, Article II) (see Appendix I).

3.5 Legal eligibility for tourist landing sites to be designated as APMS

New Zealand has established a precedent and interpreted the definition of an ASPA as being appropriate for management of three tourists landing sites (AHT, 1997: 2). Whereas many interpret the protected areas differently, and suggest that an ASMA would be a more appropriate designation for these sites (*e.g.* Clark and Perry, 1996; Johnson and Hall, 1995; Heap; 1994). It has already been established that a landing site could be designated as an ASPA if there were active management, but regulations of the Protocol would not be met if management were passive. However, since the Protocol declares that the management plan determines the method of protection, both areas designated would be legally eligible only if active management were implemented.

3.6 Permits

The process of applying for a permit is an important factor in determining whether ASPAs are practical for a tourist site. In many of the sub-Antarctic islands, where nationally issued permits are necessary, approval and issue may take months (pers. obs.). This would be extremely impractical in the Antarctic for tour operators that may only be able to give a few hours notice before landing (pers. obs.).

However, the processes of application for and granting of permits are determined in the management plan for that individual site. If a permit is being sought to visit a site with the intentions of landing tourists, then there must be active management in place. Therefore, several possibilities exist for issuing permits:

(1) since it is assumed that the APMS will have active management, perhaps the site management personnel could be the *proper authority* (Annex V, Article 1) to issue a permit locally;

(2) limited numbers of permits may be granted in advance to various ships with open dates for use;

(3) group permits could be granted to the tour operator, because individual tourists are not always known until sailing time.

Although if the system of acquiring permits were so simple, then it would negate the purpose of requiring them in the first place, and serve merely to increase the burden of bureaucracy. Similarly, if there is to be active management, there does not seem to be any reason why there is a need to designate a *landing site* as a ASPA, since the management plan is a protection mechanism in itself. If there are sensitive values to be protected within a landing site, it is also possible to incorporate an ASPA within an ASMA (Annex V Article 4 paragraph 3) . The only practical reason for designating a *landing site* as an ASPA would be to restrict the number of tourists visiting a particular site.

3.7 Summary and conclusion

APMSs offer a mechanism to manage landing sites by regulating and monitoring the effects of tourism. Although the Protected Area System of Annex V is not specifically designed for tourism, it is possible under the Protocol to designate landing sites under either an ASMA or an ASPA.

New Zealand has had three tourist landing sites designated as ASPAs, but these will probably be a unique exception. Heap (1994) defines the ASPA as a restricted area with passive management, which is not suitable for tourism.

Although ASPAs and ASMAs are seemingly designed for the values they protect, it is their method of protection that determines their effectiveness to manage tourist activities. Active management is necessary for compliance with the Protocol, and the ASMA is designed for that purpose.

The protective mechanism of the management plan will be a benefit to the environment through the monitoring and advance detection of adverse effects, which is mandatory under Article 3e. Additionally, the management plan can be designed in a manner to ensure there is not an unacceptable degree of interference with scientific research. The Annex calls for active management at the site of an ASMA, therefore, any advance indications of unacceptable impacts could be resolved, and entry to the site could be prohibited, restricted, or otherwise controlled according to the powers of the management plan.

Thus, ASMAs of Annex V, are the preferred and appropriate mechanism for managing tourist activities at landing sites in the Maritime Antarctic.

Chapter 4

Evaluating management plans from other areas to establish essential criteria for an ASMA

4.1 Introduction

Previous chapters have discussed requirements to manage tourist-landing sites and demonstrated the ASMA as the mechanism to accomplish this effectively. The management plan determines what activities may occur within the ASMA, and is required under Annex V.

This chapter evaluates six management plans (Glacier Bay, Svalbard, South Georgia, Campbell Island, Heard Island, Prince Edward Island: Table 4.1) to provide a comprehensive analysis of how different systems and legislations deal with the challenges from tourist activities in other areas. The plans evaluated are from high latitude, wilderness regions where shipborne tourism occurs, and are found to provide an adequate representative sample. Each plan is administered by a different sovereign state. The areas have all been given special designation and protection, under the authority of its plan. Thirteen criteria have been evaluated to establish essential points that have been deemed necessary for a successful management plan. The criteria will be assessed and their application to tourist activities in the Maritime Antarctic will be discussed. Other criteria that were not common among most plans, will be discussed in more detail, to consider their importance.

Personal communication with representatives of all management plans (*e.g.* M. Betts; P. Doole; M. B. Moss; E. McIntosh; C.M. Cameron; S. Barr.), has established the plans are either current or in revision at the time of writing.

4.2 Common criteria in management plans

All six plans share some common criteria. Thus, on the basis of this information, these points are deemed essential to management plans. The following seven criteria appeared in all six plans:

- Each country has legal instruments which are enforceable by the sovereign authority responsible for designation, and which apply to all individuals who enter the designated area[1]
- The sovereign country administers the sites.
- Objectives of the management plan are clearly stated.
- Monitoring programs are implemented in the plan.
- Descriptions of values that the plan is trying to protect are provided.
- General description and location of the site are provided.
- Historical information of the site is provided.

4.3 Methods of providing information for the landing site requirements

The governments of Prince Edward Islands, Campbell Island, Heard Island, Glacier Bay, and possibly South Georgia in the future, have designated observers who accompany the tourists. Where no observers are required, all plans provide a process to ensure the tour leader is briefed about the legal and management requirements. The Svalbard administration proposes to go one step further, and establish a training program for tour guides. Essentially, where no observers are present, these methods require the tour leader to manage the protected area during a visit. The tour leader is then able to inform the tourists of the requirements and procedures that must be followed for that particular landing site. In some cases educational material is given to the tourist, and in others, a copy of the management plan itself is handed out.

4.4 Requirements to enter the landing site

Each plan either requires a permit or advance notice before visiting. This enables authorities to restrict the number of tourists, and ensure that each tourist is informed of the requirements before they land. The problems of tourists arriving at a landing site unaware of its management plan or legal requirements, are discussed below. Four methods of ensuring tourists are aware of the site plans before it is entered could be:

[1] Unless they have been exclusively excepted (*e.g.* management, enforcement officer, scientist etc.)

Table 1. The table shows how six criteria chosen from the six plans are dealt with.

Management Plan	Methods of informing the management plan and legal requirements	Requirements to enter the landing site	Methods of enforcing management plan and legal requirements	Environmental assessments	Financing the management of protected area	Methods of defining the managed area
Glacier Bay (US)	Government appointed ranger, on site	Permits are required	Government appointed enforcement officer, on site	Completed	Fees charged to tourists	Tourists accompanied by on-site guide
Svalbard (Norway)	Presently voluntary. Proposed training course for guides.	Advance notice to authorities must be given before entry	Patrolling enforcement officers	No mention	Reviewing possibilities of charging tourists.	Tourists accompanied by on-site guide
South Georgia (UK)	Mandatory briefing by Government Marine Officer	Permits are required	Government appointed enforcement officer, on site	Proposed EIA to be completed by independent organization	Fees charged to tourists, vessel, and for custom dues.	Tourists accompanied by on-site guide
Campbell Island Nature Reserve (New Zealand)	Government appointed guide, on site	Permits are required	Government appointed enforcement officer, on site. If not available, the tour leader is empowered.	Completed	No mention	Tourists accompanied by on-site guide
Heard Island (Australia)	Briefing by Government appointed observer, and copies of the management plan given to tour leader.	Permit not mentioned, but limits placed on number of tourists allowed	Government appointed enforcement officer, on site.	Mandatory	Proposes charging levies to tourists	Large-scale maps clearly defines areas designated for tourist activities
Prince Edward Islands (South Africa)	Government appointed officer, on site	Permits are required	Government appointed enforcement officer, on site.	Plans to initiate EIA for tourism	No mention.	Tourists accompanied by on-site guide

1) A permit system would ensure applicants were aware of the plan. However, if a tour operator or tourist were aware they had to apply for a permit, then they could just as easily be able to request the management plan, or landing site requirements. Additionally, Annex V, Article 4, paragraph 3 states: *Entry into an ASMA shall not require a permit*.
2) An ASMA can not prohibit entry, but could make recommendations to effect entry. ATCM XVIII Working Paper 19 (1994) suggested: ... *the boundaries of Antarctic Protected Areas need to be marked by appropriate signs*. One of the methods that was proposed by ATCM XX Working Paper 15 (rev. 2) (1996) was: *Wherever feasible, markers delimiting boundaries of protected areas, and of zones of scientific interest, and warnings to visitors about their nature will be provided*. Although signs can not fulfill the requirements necessary to inform the visitor of the management plan and legal requirements for a specific site, they could act as a deterrent from entering the site until the requirements are understood. This could have an adverse effect on the aesthetic qualities of the landing site, but the benefit it may offer mitigates the negative aspects.
3) ATCM XXI Working Paper 22 (ATCM XXI, 1997) suggests applying departure state jurisdiction as a method to ensure compliance with the Protocol. *Because of problems in exercising jurisdiction in Antarctica, one of the more effective ways of controlling activities is through the jurisdiction of the Departure State*. Since all expeditions have to leave from somewhere, the paper suggests that this method may be suitable to ensure all expeditions are aware of the requirements of the Protocol. This could also be applied to ensure that there is an awareness of a management plan and its requirements before it is visited. This is currently being done by expeditions leaving from New Zealand to destinations in the Ross Dependency, Antarctica.
4) A similar method, but less formal, would be to have educational information on the Protocol, IAATO Guidelines and Code of Conduct or ATCM XVIII-Rec. 1, and management plans of protected areas, available to all expeditions leaving from various ports. This season (1998-1999) there were 24 different private yachts that visited one Maritime Antarctic site at Port Lockroy, and some made more than one voyage (D. Berkitt, pers. com.). Since most of these left from Ushuaia, many would have visited the information centre, where information and plans could be made available to the expedition leader, or captain. Barrio and Roldan

(pers. com.) give yacht captains the same information given to the expedition leaders; information related to protected areas in the Antarctic Peninsula Region, the official text of ATCM XVIII Recommendation-1, radio frequencies, etc. Additionally, a similar information centre is close to the harbour and pier in Port Stanley, Falkland Islands. From 1995 to 1998, all tourist ships stopped in Ushuaia before or after visiting the Maritime Antarctic (Barrio and Roldan, 1998). At least 78% are confirmed to have started in Ushuaia. However, there are currently no ships departing for Antarctica from ports outside territories of signatories of the ATS (R.K. Headland, pers com.).

4.5 Methods of enforcing compliance with the landing site requirements

Confidence in the management and enforcement abilities of IAATO tour leaders is exhibited by the South Georgia administration that proposes limiting the issue of permits to tour operators that are IAATO members only (British Antarctic Survey, 1999). Additionally, the Campbell Island plan empowers tour leaders in the event that a government appointed guide is not available.

The report from ATCM XVI (1991), Information Paper 59 contains comments from a US observer regarding tourist-landing operations: *Overall these companies take their responsibilities for protecting the Antarctic environment very seriously, and their efforts should be used as example for operators from other countrie*s. This comment demonstrates that tour leaders are generally believed to manage tourist activities effectively.

It is unlikely that there will be permanent active management at each site, or observers aboard all vessels in the near future in the Maritime Antarctic. Tour leaders on IAATO vessels have been given the relevant information, and are generally accepted to be effective at educating their tourists and ensuring compliance with the legal and environmental requirements and Guidelines. Since tour leaders are effectively implementing active management during tourist activities, this complies with the definitions of active management required for an ASMA. Many tour operators in the field take pride in the way they manage tourist activities and enforce the legal and environmental requirements (Kim Crosbie, pers. com.; pers. obs.). Infractions would be less likely to occur with tourists that have been educated in the

requirements of their landing activities. Tourists that are aware of the requirements are also more likely to keep each other from causing any infractions (Crosbie, 1998; ATCM XVI, 1991; pers. obs.).

4.6 Environmental assessments

The South Georgia government has proposed mandatory environmental assessments for tourist developments and expeditions activities, *which is expected by the Government to have a significant environmental impact* (British Antarctic Survey, 1999). The Government may also request that assessments be conducted by an *independent organization* (ibid.). The Prince Edward Islands administration has initiated environmental assessments in an area of limited tourism (Prince Edward Islands Management Plan Working Group, 1996). Heard Island requires an activity to submit an evaluation of potential impacts before they begin. These are then scrutinized by the administration to ensure they are thorough and consistent with the objectives and management plans of the territory.

4.7 Methods of financing the managed area

Four of the plans presently, or propose in the future to, charge fees for tourist landings, to cover administrative costs. It is common practice elsewhere in the world for seaborne tourism to encounter fees for the use of land or sovereign waterways.

Crosbie (1998) and Enzenbacher (1995) suggest various ways of financing the administration and management of tourist landing sites in Antarctica. They include, *inter alia,* sharing the financial burden of managing Antarctic tourism between the ATCPs, tour operators, and the tourists.

Implementing a protected area to manage tourist activities provides a resource to exploit, and revenue to capitalize for the commercial tour operator. Therefore, it is unlikely that any Party or organization, other than IAATO would undertake the financial obligation and administration of an ASMA designed to manage tourist activities. IAATO is a genuine commercial organization that generates its revenues by exploiting resources in the Maritime Antarctic (*inter alia*). However, tourism is an

accepted activity, the freedom of which is ensured by Article 1 of the Antarctic Treaty (Joyner, 1998), and neither IAATO nor the tourists have any obligation to maintain an ASMA designated for their use, except perhaps a moral one.

4.8 Methods of defining the managed area

All the areas studied require, or intend to require tourist activities to be managed by appointed personnel on-site to ensure compliance with the plan. It is possible that these persons mitigate the need for maps, since only Heard Island included several large-scale maps in the plan that clearly delineates the managed area.

However, the Maritime Antarctic generally has neither observers, nor marked boundaries at tourist landing sites. Tour leaders are known to apply various boundaries for each site, and most of them would be un-definable (pers. obs.). Some operators define landing site boundaries by using objects such as traffic cones, but this is not consistently done and would differ according to the tour leader. Often this is done for purposes other than site protection, such as keeping groups together.

If it is desired to use, manage, and monitor a site in an accurate and consistent way, then the boundaries of the site need to be clearly indicated. Knowledge of the physical boundaries of an area can minimize the possibilities of accidental infractions or violations.

ATCM XVIII, Rec-1 states that: *visitors should know the locations of areas that have been afforded special protection and any restrictions regarding entry and activities that can be carried out in and near them*. Although detailed descriptions and coordinates help, there may not be enough distinguishable physical features, or means to fix coordinates. Thus, large-scale maps with distinguishable physical and biological features are required (*e.g.* Naveen 1997a and 1997b; Australia Antarctic Division, 1995; Stonehouse, 1995). The contents and design, and the minimum requirements of the maps recommended by SCAR, are discussed in the next chapter.

4.9 Summary and conclusions

Of the seven common criteria found in the plans, five could easily be implemented by an ASMA, and should be considered an integral part of the management plan:

- Objectives of the management plan are clearly stated.
- Monitoring programs are implemented to work with the plan.
- Description of values that the plan is trying to protect.
- General description and location of the site.
- Historical information of the site.

However, the sovereign powers of the six sites have laws and administration which can not be duplicated in an ASMA.

Annex V does not provide for an authority to administer an ASMA. The Party proposing the designation is to be responsible for the actions of their own nationals, as well as those of other nationals (Clark and Perry, 1996).

All six plans ensure that the tourists are fully briefed on the requirements of the management plan and the legal requirements before landing. Some provide local guides, and Svalbard, proposes a training program to instruct guides. Many of the plans provide literature containing information about, and requirements of the site. Heard Island requirements give the management plan booklet to tourists. There are no provisions in the ATS to ensure that tourists are aware of protected areas or their management plans. Although Annex V, Article 6, paragraph 5 states: *upon approval, the Management plan shall be circulated promptly by the Depository, to all Parties*, this does not guarantee the information will reach the tour operator, expedition leader or tourist.

Private and non-IAATO expeditions, such as yachts, have not always received the information enabling them to comply, except possibly from a few published guidebooks (*e.g.* Naveen, 97a; Wheeler, 1997; Rubin, 1996). The availability of educational material for tourist destinations is essential because it increases awareness and the chances for compliance of the plan and its legal requirements.

All six plans require advance notice or a permit to enter a landing site. Annex V does not allow the use of permits to enter an ASMA. Therefore, the advantages of ensuring tourists are aware of the management plan and legal requirements before landings are lost. One way to ensure that this information is received would be to

make it available at ports of departure. Erecting signs at the point of entry at ASMA landing-sites, could deter those that do not have the information to comply with the management plan.

It is unrealistic to believe that there will be any organized enforcement officers or full-time active management at sites in the Maritime Antarctic in the near future. Article 13, paragraph 1 of the Protocol states: *each Party shall take appropriate measures within its competence, including adoption of laws, regulations, administrative actions and enforcement measures, to ensure compliance with this Protocol*. Although this suggests self-regulation by the tourist, the expedition leader and staff endeavor to ensure compliance (Crosbie, 1998; pers. obs.), even though they may have no authorized enforcement powers. Tour operators have assumed the role of enforcement with their passengers, and are generally accepted as being effective. Therefore, it can be logically assumed that private expeditions and yachts that have been provided with adequate information should be able to manage effectively their activities as well. Although it is unlikely that tour operators would take any legal action against one of their customers, awareness of the rules would logically minimize the incidents of violations. The lack of sovereign authority in the ATS does not provide for complete control of ensuring compliance with management plans and legal requirements.

With the exception of Svalbard, all plans mention the need for environmental assessments of human activities. In all cases they have been, or proposed to be conducted by the administration or persons other than the tour operators. As discussed in Chapter II, the Protocol requires that an IEE must be conducted for tourist activities. Containing tourist activities within an ASMA minimizes the problems and the ambiguity of the IEE because the monitoring requirements of activities within an ASMA satisfy the environmental regulations of Article 3 of the Protocol.

The majority of finances for the management of an ASMA would have to come from the tourists that use the site through a levy charged by the tour operator. It would be difficult to charge the independent or private expedition, but they are presently minimal users compared to IAATO (see section 1.3).

Chapter 5

Requirements for preparing an ASMA management plan

5.1 Introduction

The need to manage tourist-landing sites has been discussed. Chapter three indicated the ASMA as a way to achieve this, which requires a management plan. Chapter four investigated six different plans to establish what criteria were considered essential. This chapter discusses the requirements and developments of management plans for an ASMA.

Not only is it necessary for the plan to be designed so that its objectives can be met, it must also meet the requirements of the ATS, based on recommendations by SCAR. Additionally, the ASPA management plan will be a basis for national legislation (ATCM XX/WP 18, 1997).

Although Annex V has not yet come into force, SCAR has established a uniform format for preparing all future ASPA management plans. There are already some protected areas that are operating voluntarily under new ASPA plans, however, there have yet been no ASMA plans approved or designed as a prototype. This chapter discusses the criteria necessary to achieve this.

5.2 ATS recommendations for preparation of an Annex V management plan

Annex V requirements for management plans are clarified in the text of the document (see Appendix II), and detailed specifically by SCAR Measure 1, Resolution 9 (1995). The Party members at ATCM XIX accepted the SCAR recommendation for a uniform model for management plans of an ASPA. Annex A to Measure 1 (1995) of ATCM XIX is a plan for Moe Island that is explained as: *the model for all new and revised management plans for protected areas for the purpose of Annex V*. Working Paper 18 submitted by SCAR to ATCM XXI (1997) is a guide to the preparation of

management plans for ASPAs; its objectives are:

- to develop a uniform style for the writing of plans to make them more straightforward and their application by scientists much simpler. This includes advice on content, style, numbering sequence and phraseology.
- to ensure the plans meet the requirements of the Treaty and Protocol, and are also easy to understand by using direct and unambiguous language.
- to ensure the plan meets the criteria necessary for it to be the basis for a legal document for national legislation.
- to provide for a consistent format for all plans.

Since a uniform format has been established for an ASPA, it could logically be presumed that SCAR would endeavor to recommend a uniform format for ASMAs.

There are currently only two areas that are operating as unofficially designated ASMAs. The first is the US proposed Multiple-use Planning Area (MPA) management plan (ATCM XVI, 1991). It continues to operate under the MPA designation for the Southwest Anvers Island and vicinity, but will convert to an ASMA designation when Annex V is in force.

Brazil submitted the second area with working Paper 15 (Rev 2) at the ATCM XX (1996). Although Annex V is not yet in effect, the five Parties involved (Ecuador, Brazil, Peru, Poland, and US) have agreed to conform to the plan voluntarily.

Both plans are structurally different and neither has been officially recognized as the prototype for an ASMA, therefore, a need to develop a suitable model persists.

5.3 Essential criteria prevented by lack of sovereign authority

The plan for Admiralty Bay includes all criteria that were considered essential in the other plans, except four points (Table 5.1). These are directly related to sovereignty issues which provide for the authority to create and enforce laws, charge fees, and place demands on entry requirements in the other six plans.

To design the best management plan for an ASMA, additional criteria, other than those studied in chapter four, must be considered. SCAR has placed much emphasis on phraseology, importance of the plan as an international legal document and other specifics that are uniquely related to the Treaty. Therefore, the

implementation into an ASMA of one, or a combination of the six plans studied would be unlikely. However, the Admiralty Bay plan, and the Annex V requirements for an ASMA management plan satisfy all but four of the essential criteria, which are directly related to sovereignty issues, and were discussed in Chapter Four.

Criteria of management plans	Admiralty Bay	Annex V	Six Plans
Sovereign authority which apply to all individuals who enter the designated area	No	No	Yes
The sovereign country administers the sites.	No	No	Yes
Methods of providing information of the management plan and legal requirements	Yes	Yes	Yes
Requirements to enter the landing site	No	No	Yes
Methods of enforcing management plan and legal requirements	No	No	Yes
Environmental assessments	Yes	Yes	Yes
Methods of financing the plan	Yes	No	Yes
Methods of defining the managed area	Yes	Yes	Yes
Objectives of the management plan are clearly stated.	Yes	Yes	Yes
Monitoring programs are implemented to work in conjunction with the plan.	Yes	Yes	Yes
Description of values that the plan is trying to protect.	Yes	Yes	Yes
General description and location of the site.	Yes	Yes	Yes
Historical information of the site.	Yes	Yes	Yes

Table 5.1 The table shows the criteria that most of the six plans evaluated in chapter four contained. The criteria missing from Admiralty Bay and the Annex V text are all directly related to sovereignty issues.

5.4 Summary and conclusions

The ATS has determined that a uniform format for the preparation of an ASPA is necessary for its unique requirements. The general principle of this appears to be based on simplicity, consistency, and meeting the legal criteria.

The same principle should apply to an ASMA designation. Although there are presently two areas that would be officially designated as ASMAs upon Annex V entering into force, neither has been recognized (as the case of Moe Island for an ASPA) as having an ideal management plan. This would appear to reflect the opinion of SCAR that the existing areas operating as ASMAs may not be satisfactory as a model for a uniform format. Thus it would not be practical to design a plan in the same format as either of the two acting-ASMAs.

Plans that were evaluated in chapter four would not be an acceptable format for an ASMA because they all required sovereign authority to operate successfully. They were evaluated to determine common criteria that could be considered essential. All of these essential points, except four, are found in Annex V requirements, and the existing ASMA for Admiralty Bay. The four exceptions are directly related to sovereign authority, and were discussed, and solutions proposed, in chapter four.

Therefore, the most practical plan for an ASMA, which would also be acceptable to the ATS has not yet been determined. However, this could be achieved by:

(a) implementing the essential criteria mentioned in chapter four;
(b) using similar phraseology in plans accepted by the ATS and the SCAR guide book;
(c) implementing the same simple structure of plans accepted by the ATS;
(d) complying with Annex V requirements

Although this would enable a plan to work functionally under the ATS regulations, it would not be considered as effective as a plan with sovereign authority.

Chapter 6

Reasons for selecting parts of Deception Island for an ASMA, and the monitoring Programme

6.1 Introduction

Deception Island (see Chapter 7:24 for maps and photographs) is the site that has been selected for the application of a model management plan. The wide range of its environmental and protective needs and the ability to demonstrate the effectiveness of the prototype plan, make Deception Island a good candidate for selection. This chapter discusses the reasons why Deception Island has been selected as a site for an ASMA, and explains the monitoring plan that is required by the Protocol.

Monitoring is a fundamental element of environmental management and conservation, and is only useful when it is closely associated with an environmental management strategy (SCAR and COMNAP, 1996: vii). Previous studies (*e.g.* Crosbie, 1998) have reported acceptable principles of monitoring tourist landing sites, therefore they will not be repeated here. However the monitoring objectives and the activities which are involved will be discussed.

6.2 Reasons for the selection of parts of Deception Island as an ASMA

Annex V states that ASMAs may include: *(a) areas where activities pose risks of mutual interference or cumulative impacts; and (b) sites or monuments of recognized historic value*. Additionally an area may be chosen to assist in the planning and coordination of activities, to avoid possible conflicts, to improve cooperation between Parties or to minimize environmental impacts. Table 6.2 elucidates the detailed reasons for selection.

Deception Island has been chosen as a site that is:

(a) representative of the criteria necessary in Annex V to designate an ASMA;

(b) representative of the Maritime Antarctic region; and

(c) suitable for monitoring and attaining the objectives of the plan.

Deception Island is the site of scientific projects of several National Parties. There are presently two research stations open during summer by Argentina and Spain. The UK monitors five terrestrial SSSIs and Chile monitors two benthic SSSIs that are all long-term projects. Brazil has operated a summer scientific field camp for the last few years, and the US has recently begun an oceanographic project in Port Foster.

Deception Island is also a favorite of tour operators who have visited three sites 748 times, and discharged 62, 239 tourists during the nine-year period 1989-98 (see section 7-18) (IAATO, 1998). There are three popular tourist landing sites; Pendulum Cove, Baily Head, and Whalers Bay (see Chapter 7).

Cumulative effects	• Whalers Bay is ranked the most visited tourist-landing site. • Pendulum Cove is ranked third most visited tourist landing site. • Baily Head is ranked sixth most visited tourist landing site. (see Table 7.1-7.3)
Risk of mutual interference between research and tourism	• Argentine research base • Spanish research base • UK monitors 5 SSSIs • Chile monitors 2 SSSIs • Brazil has a summer field camp • US has oceanological program • Oceanites (US) does sporadic site surveys
Poorly marked coordinates and boundaries	• Seven SSSIs in areas used by tourists that are poorly or inaccurately marked. • Three HSMs that are inadequately marked.
Potential disturbance to flora and fauna	• Nesting chinstrap penguins • Numerous fur seals hauled out in late summer • Nesting pintado petrels • Nesting Dominican gulls • Nesting Antarctic terns • Numerous lichens and other plants
Possible injury to visitors	• Open wells • Unsafe structures • Asbestos in buildings • Fur seal bites • Volcanic eruption • Scalding water
Artifacts	• Susceptible to damage • Susceptible to theft
Representative of the area	• Maritime climate • Diverse biology • Relatively close to other sites in the area
Other	• Could complement the proposed plan by the UK • It is possible to monitor 3 sites simultaneously

Table 6.1. Reasons for selecting Deception Island as a site to implement ASMAs

Baily Head has an exceptional abundance of approximately 100,000 pairs of breeding chinstrap penguins (Woehler, 1993: 36). This is one of the largest colonies of chinstrap penguins in the Maritime Antarctic (ibid.). Numerous fur seals haul-out on the beach in the late summer, which makes landing difficult without violations of the ATS or risk of injury to visitors and animals.

Pendulum Cove is the site of SSSI 21D and the ruins of *Pedro Aquirre Cerda*, a Chilean station. The ruins are not maintained and could injure visitors. The landing site is close to a SSSI that has unclear boundaries, therefore its exact location is uncertain and susceptible to penetration.

Whalers Bay has a unique history in the Antarctic exploration, commerce and science. Numerous structures of historic content occur throughout it. Most are in a poor state of repair, and could cause injury if entered carelessly. Large amounts of asbestos that remain in some structures may harm the visitor. The ATS has designated three HSMs within the landing site, as well as one SSSI. The grid used to mark coordinates is not stated, therefore most of these protected areas are inadequately marked, and the location uncertain. There are several locations with breeding seabirds that might easily be disturbed by visitors. There have also been cases of artifacts being removed from the area (R. Downie, pers. com.; pers. obs.).

At the time of writing, the UK Foreign Office is proposing a management strategy to Party members at the ATCM XXIII, for Deception Island (M. Richardson, R. Downie, P. Cooper, J. Shears, all pers. com.). Although this is still in the draft stages, the strategy may exclude the areas of popular tourist landing sites. A management plan for the tourist landing sites of Deception Island could complement the plan of the UK by protecting areas that may have been excluded.

The distance between the three sites, enable all to be studied simultaneously. Precedents of multiple sites under the jurisdiction of one plan have been accepted by the ATS in previous management plans (*e.g.* SSSI 21 [ATCM XIII, 1985]; SSSI 27 [ATCM XIV, 1987]; MPA Southwest Anvers Island and vicinity [ATCM XVI, 1991]; ASMA for Admiralty Bay [ATCM XX, 1996]).

Other infrequently visited sites on the island that are not included in this study are the two research stations and Telefon Bay. The stations are not included because they would have their own plans to manage visitor activities and Telefon Bay is seldom visited and is considered by this study to have insignificant or un-measurable values to be protected from tourist activities.

6.3 The monitoring plan of Deception Island

Crosbie (1998: 180-202) and Minbashian (1997) outline the principles on which an effective monitoring program should be based for tourist landing sites in the Maritime Antarctic. These conform to SCAR and COMNAP (1996) recommendations, and are acceptable and applicable to this study.

6.3.1 Monitoring objectives

The objectives of the monitoring plan are to obtain a regular and accurate record of activities and environmental data to:

1) Assess consequences of activities, including those predicted by environmental assessments and;
   (a) provide early indications of adverse effects;
   (b) determine preventative or remedial measures to reduce or eliminate adverse effects;
   (c) plan similar activities in the future.
2) Prepare Geographic Information System (GIS) maps that may be useful in long term environmental monitoring (CEP, 1998; SCAR and COMNAP, 1996; Waugh, 1994; Harris, 1993; Clarkson, 1994).

6.3.2 Monitoring program

The monitoring program and the data processing should be undertaken by an *Independent Organization* with experience of monitoring programs in Antarctica (*e.g.* Project Antarctic Conservation or Oceanites). Uniform formats for selected monitoring parameters to facilitate assessment of data will be necessary (Crosbie, 1998; Nimon, 1997; SCAR Bird Biology Sub Committee, 1996; Woehler, 1993; CCAMLR Environmental Monitoring Program, 1992; Bibby *et al*, 1992). All data will be analyzed scientifically, and recommendations based on the results and the management objectives. The data and recommendations will be revised on a minimum of an annual basis, and published.

Coordination with related programs will be established to coordinate an inventory of activities in the area. This will provide details for all users and establish quality assurance systems for comparability of data with those of other programs and regions (SCAR and COMNAP, 1996). Similar programs will be run at all three locations simultaneously.

Methods of data storage and retrieval will be adequate for the duration of the project and a central database network for storage, dissemination and analysis of data will be established.

6.3.3 The activities of the monitoring team on Deception Island

A temporary camp for two to four personnel should be located at Whalers Bay for approximately 2-3 weeks. The location of the camp is marked on map 7.3. Transport of the materials and personnel, and removal of waste will be aboard tourist vessels. There are no plans for field camps at Baily Head or Pendulum Cove. However, there will be provisions for emergency shelter during a forced stay if necessary.

Movement of personnel between sites will be by:

(a) tourist vessels.

(b) trekking between Whalers Bay and Baily Head.

(c) small boat between Whalers Bay and Pendulum Cove.

(d) trekking across the glacier at the base of Mt. Pond, between Whalers Bay and Pendulum Cove.

Monitoring personnel would be transported to the site by tourist vessel at least twice after the camp has been removed to continue the monitoring, which will continue twice per annum for the period of designation of the management plan.

6.4 Summary and conclusions

Deception Island is an exceptional site for implementation of the ASMAs indicated in this study. Increasing visits to the sites may pose risks to science, the flora and fauna, and the visitors themselves. Its location is indicative of the rest of the Maritime Antarctic, and enables three sites to be managed and monitored simultaneously. The

incorporation of three sites within the same management plan demonstrates that it could be used effectively as a model for a uniform format.

The monitoring program provides essential information necessary to achieve the objectives of the management plan, and provide criteria for compliance with the ATS. The use of tour ships for coordinating activities will enable the program to run in an operational and cost efficient manner.

Chapter 7

Model ASMA plan applied to Deception Island

7.1 Introduction

This management plan is designed to comply with the ATS, particularly to the Protocol. To comply with Annex I of the Protocol, an IEE has been completed, which demonstrated that tourism activity is likely to have no more than a minor or transitory impact.

The plan contains a monitoring program to determine the impact of tourism during an indefinite time and which conforms to requirements of the Protocol. Recommendations from SCAR, Committee of Managers for National Antarctic Programmes (COMNAP), (SCAR and COMNAP, 1996), and CEP (CEP, 1998), have been accommodated within this management plan. ATCM XVIII Rec. 1 and adherence to IAATO Guidelines and Codes of Conduct are necessary for compliance with this management plan.

Essential criteria, derived from the evaluation of six plans in chapter four, have been included, and phraseology that SCAR and COMNAP (1996) has considered important for consistency, is used and indicated by *Italics*. The simplicity of existing plans that have been accepted by the ATS has been followed.

Deception Island has been evaluated and determined to be an acceptable site to implement the model plan. The grid used to establish coordinates for Deception Island are taken from British Admiralty chart 3202.

There are three sites included within this plan that have been demonstrated as an acceptable practice by the ATS (see section 6.2). The ATS has shown a desire to develop a uniform format for Annex V management plans, yet this has not been accomplished for an ASMA. The incorporation of three separate areas within one plan (section 7.2) indicates this format could be implemented as a uniform model for an ASMA.

7.2 The management plan for Deception Island

Conforming to Articles 2, and 4-6 of Annex V of the Protocol, it is suggested that defined areas of Deception Island be designated as ASMAs, and that activities in them be managed by the accompanying plan.

1 Description of the area

(I) *General Description*:

i. Baily Head (also known as Rancho Point) is a rocky promontory 168m high. It is the eastern-most portion of Deception Island. The landing leads to a natural amphitheater with the sides rising to approximately 150 m. Two large melt-streams flow approximately through the middle of the site, and merge close to the landing point. There is an abundance of *Prasiola crispa* on the level ground. The majority of penguins, which are chinstraps, use the same landing point as the tourists. Estimates of 100,000 chinstraps nest on the slopes and rocky floor. The landing site covers approximately 135,000 m^2. Map 7.1 illustrates the zones within this plan. The beach is nearly always free from snow and ice, but can occasionally fill with brash ice that makes landing very difficult. By February, fur seals become so numerous that landing is not possible without infractions of ATCM XVIII Rec.1 and IAATO guidelines, as well as risking persons being bitten seriously.

ii. Pendulum Cove is in the northeast part of the caldera of Deception Island. The beach is a flat, black, cinder/sand that slopes gently from the ruins of the Chilean base, *Pedro Aguirre Cerda* that was destroyed during the 1969 eruption. A series of gullies, eroded by melt-water streams, is prevalent past the base, and continue to the cliff face that is largely impregnated with glacial ice covered in ash. Steam often engulfs the beach area and the heated melt-water streams close to shore. Loose cinder beach makes walking easy. The features that attract tourists to this site are the geo-thermal waters close to shore. Care should be exercised when walking in the sand and water with bare feet, as people have been scalded. SSSI 21D is not marked, and could be penetrated accidentally, unless clear guidance is

given (see Map 7.2). The total area is approximately 289 m^2, which extends between two points on the beach, between the sea and 25m above the high tide mark. Sea ice in the caldera has usually dispersed by mid-November, but has occasionally remained until mid-December. The beach is nearly always free from snow and ice.

iii. Whalers Bay landing site is approximately 770,000 m^2 most of it is flat medium sorted, black volcanic gravel. Structures, derelict equipment and other artifacts from a whaling factory and base cover much of the area. The landing site is approximately 2,000 m wide, and is easy to walk on. The borders are marked clearly on map 7.3, it is largely flat and level except for Neptune's Window with the trail to the pintado petrel nests, and Ronald Hill. Sea ice in Whalers Bay has usually dispersed by mid-November, but has occasionally remained until mid-December. The beach is nearly always free from snow and ice.

(II) *Geographic coordinates, boundary markers, and natural features* (The grid for all coordinates are from the British Admiralty Chart 3202.) :

i. Baily Head: The area covered by the management plan (Map 7.1) is approximately 400 m of beach, between the low tide mark and the glacial face. The coordinates between these two points are 62° 57' 50" S, 60° 30" 14" W and 62° 57' 40" S, 60° 30' 14" W. From the beach to the boundary inland, the following coordinates define the area covered in the management plan (see Map 7.1) 62° 58' 12" S, 60° 30' 40" W; 62° 58' 18" S, 60° 30' 50" W; 62° 58' 18" S, 60° 31' 12" W; 62° 58' 00" S, 60° 31' 00" W; 62° 57' 45" S, 60° 30' 15" W.

ii. Pendulum Cove: The area covered by the management plan is the beach of Pendulum Cove from 25m above the high tide level, to the sea, running approximately 320m long. The coordinates of the northern boundary are the line between 62° 56'13" S, 60° 36' 00" W and 62° 56' 15" S, 60° 35' 40" W. The coordinates of the southern point are the line between 62° 56' 23" S,60° 36" 02"W, 25 m north of the SSSI and opposite the non-existent wreck marked on the British chart 3202 and the USA chart 29103 (Map 7.2). The ruins of the base are in the vicinity of 62° 56' 18" S, 60° 35' 36W, in the control zone.

iii. Whalers Bay: There is approximately 1,200 m of beach from 62° 59' 21" S, 60° 33' 24" W (map 7.3, number 7) to 62° 58' 54" S, 60° 34' 04" W (map 7.3, number 8). The west side boundaries are the 50 m distance from the shore of Kroner Lake, and due north from 62° 58' 56" S, 60° 34' 40" W (map 7.3, number 2) to the peak of Ronald Hill 62° 58' 32" S, 60° 34' 40" W (map 7.3, number 3). The northern boundary follows a line to the boundary point 62° 58' 32" S, 60° 34' 08" W (Map 7.3 number 4), then along level ground from Ronald Hill to Neptune's Window on the eastern boundary, which has an elevation of approximately 40 m. The southern boundary is the path from Neptune's Window to the pintado petrel nests approximately 400 m away. Care should be taken to use only one path.

(III) *Description and coordinates of landing point*

i. Baily Head: The beach has a gravely, volcanic black, packed surface. Large swells can roll in, even on calm days. Special attention should be paid to increasing wind speed or wind shift, as this can cause the rollers to break dangerously. Care must be taken with steep drop off from the beach, and a strong undertow is usually present. The coordinates are 62° 57' 50" S, 60° 30" 14" W.

ii. Pendulum Cove: The landing point for small craft is on the beach, opposite the submerged wreck, marked on the British chart 3202 and the US chart 29103[1]. The coordinates are 62° 56' 24" S, 60° 36" 02"W. This is the southern boundary of the landing site of this management plan and 25m north of the northern boundary of SSSI 21D.

iii. *Whalers Bay*: The beach is a medium sorted, volcanic black gravel. At low tide the water remains fairly shallow for 3-4 m before it drops off. The landing point for small craft is by the floating dock (62° 58' 55" S, 62° 33' 35" W: map 7.3 number G), where they may be hauled ashore and secured. The water can be quite warm in spots, especially at low tide. The sea comes to the base of the dry dock at high tide. Large swells are not a problem because of the good protection

[1] Headland (pers. com.) believes the wreck is actually the former location of the Telefon, which has since been moved.

of the harbour. The beach coordinates for small craft is 62° 58'55" S, 60° 33' 44" W.

(IV) *Climate*: (see Table 7.1)

2 *Aims and Objectives*

(I) To ensure that visitors (tourists, others, and studies associated with this plan) do not cause any adverse impacts to:

- the environment, dependent and associated eco-systems;
- the intrinsic value, including wilderness, historical, biological, cultural, and other aesthetic aspects;
- its value as an area for scientific research.

(II) To ensure compliance with the instruments of the ATS.

3 *Management activities*

With regard to the basic guidelines as provided by the Protocol, and its Annexes I-V, and the relevant ATCM recommendations, the following management activities are proposed for the area (ATCM XX/WP 15, 1996):

- The Parties that conduct research in the area shall manage activities of their nationals in the ASMA. They should request that other Antarctic Treaty Parties undertake to manage the activities of their nationals when in the ASMA in accordance with the Protocol and this management plan (ibid.).
- During the first season of this plan, a temporary self-contained camp for two to four personnel will be used for approximately 2-3 weeks Whalers Bay. The proposed location of the camp is marked on map 7.3.
- The monitoring of key variables will continue throughout the season, and will continue for the period of designation of the management plan.

4 *Proposals for designation of new protected areas*

None at the present

5 *Access by land, sea, air*

i. Baily Head:

- Fixed Wing aircraft: There is no access for fixed wing aircraft.
- Helicopter: The only possible landing point would the beach, however no site is designated.
- Pedestrian: No pedestrian routes are designated, although there is an unmarked route to Whalers Bay, which is not recommended for tourists.
- Land Vehicle: No access designated.
- Small Boat: This management plan recommends small craft as the only method for reaching this site

ii. Pendulum Cove:

- Fixed Wing: There is no access for fixed wing aircraft.
- Helicopter: There is no designated landing point. It is prohibited to land within, or near the boundaries of SSSI 21D.
- Pedestrian: No pedestrian routes are designated.
- Land Vehicle: Land vehicles are not prohibited, but their use is not recommended.
- Small Boat: This management plan recommends small craft as the only method for reaching this site.

iii. Whalers Bay:

- Fixed Wing: Although an area had been used previously, there is no maintained site designated.
- Helicopter: Landing may be possible, but no area is designated.

- Pedestrian: No pedestrian routes are presently designated, however, BAS is planning to mark emergency exit routes in case of volcanic events.
- Land Vehicle: Land vehicles are not prohibited, but their use is not recommended.
- Small Boat: This management plan recommends small craft as the only method for accessing this site.

6 *Location of permanent structures*

i. Baily Head: None.

ii. Pendulum Cove: Ruins of a Chilean station, destroyed by the volcanic eruption of 1969 are in the vicinity.

iii. Whalers Bay: See map 6.4. The monitoring program will identify, with more accuracy, the location of all structures including.

- A: Hanger; 62° 58' 52" S, 60° 34' 28" W.
- B: Magistrates Residence; 62° 58' 50" S, 60° 34' 10" W
- C: Biscoe House; 62° 58' 49" S, 60° 34' 07" W
- D: Old Barracks; 62° 58' 51" S, 60° 33' 50" W
- E: Oil tanks; 62° 58' 52" S, 60° 33' 49" W
- F: Boilers; 62° 58' 52" S, 60° 33' 54" W
- G: Dry dock; 62° 58' 55" S, 60° 33' 44" W
- H: Red gabled hut; 62° 58' 57" S, 60° 33' 35" W
- I: Well hut; 62° 58' 16" S, 60° 33' 13" W
- The location of several more structures and artifacts will be identified by the monitoring program

7 *Location of minor and/or semi-permanent structures*

i. Baily Head: None.

ii. Pendulum Cove: None.

iii. Whalers Bay: Field camp consisting of one or two tents. The location for the site will be 62° 59' 16" S, 60° 32' 57" W (map 7.4, M). Numerous artifacts, derelict structures, barrel staves, waterboats *etc.* are distributed unevenly throughout the area.

8 Protected zones

(I) *Protected zones within the ASMA*

i. Baily Head: None.

ii. Pendulum Cove: None.

iii. Whalers Bay:

(a) Restricted area SSSI 21E , Kroner Lake, is outside the ASMA of Whalers Bay. The coordinates given in the ATCM XIII specifications are unreliable. Coordinates from the centre of Kroner Lake are 62° 59' 02" S, 60° 34' 48" W. The protected area is the lake and a zone which includes the perimeter of 50 m (Map 7.3 and 7.4). There are no visible markings to indicate the boundaries of the site. Visitors should be extremely cautious to avoid the SSSI. This is a long-term study of vegetation that is extremely vulnerable to trampling and contamination and entry is prohibited.

(b) There are three HSMs within this management plan, HSM 31 and 58 are buried beneath the ash and not visible, and 71 is the whaling station. Access to these areas is permitted under the protection of the management plan.

(II) *Other Protected Areas within proximity*

i. Baily Head: None

ii. Pendulum *Cove*:

(a) There is a restricted area, SSSI 21D, at Pendulum Cove which is described as a strip of land 100 m wide extending from the high water mark of the heated shorelines to a series of gullies 750 m inland. The area lies about 300 m south of the former Chilean Base, *Pedro Aguirre Cerda* (see Map 7.4). The coordinates that are given are 62° 56'S, 60° 35'W, however these are

unreliable. There are no visible markings to indicate the boundaries of the site. This is a long-term study of vegetation that is extremely vulnerable to trampling and contamination. Visitors should be extremely cautious to avoid the SSSI. By adhering to this management plan, the danger of penetrating the SSSI is minimized.

(b) There are two benthic SSSIs close to Pendulum Cove. (1) SSSI 27A, between 50 and 150 m deep and the coordinates; 62°55'30" S, 60° 38'00" W and 62°56'12" S, 60°37'00" W. (2) SSSI 27B, between 100 and 150 m deep and the coordinates; 62°57'12" S, 60°37'20" W and 62°57'54" S, 60°36'20" W (map 7.5). These areas have been designated to study the benthic biota, and changes after the 1967 eruption. There is free access for ships through these areas, but dumping of wastes, bottom trawling, and anchoring are prohibited.

(c) There are four other SSSIs within the caldera of Deception Island: SSSI 21A, 21B, 21C, 21E. Information on these restricted area is in Map 7.4 and ATCM XIII (1985:13).

iii Whalers Bay: There are four other SSSIs within the caldera of Deception Island: SSSI 21A, 21B, 21C, 21D. More information on these restricted areas is in Map 7.4 and ATCM XIII (1985:13).

9 *Areas in which activities should be regulated*

(I) *Zones visited by tourists*

See section 1 (I) – 1 (II)

(II) *Zones of scientific and/or ecological interest where access of tourists and other visitors should be controlled*

i. Baily Head:

(a) A control zone has been defined for this management plan. Entry is not prohibited, but it is strongly recommended that the *Independent Organization* is informed before the areas within the following boundaries are entered.

(b) All areas east of the most easterly melt-stream up to the coordinates 62° 58' 12" S, 60° 30' 40" W, and east of the area between the points; 62° 58' 12" S, 60° 30' 40" W and 62° 58' 18" S, 60° 30' 50" W (Map 7.1).

ii. Pendulum Cove:

(a) A control zone has been defined to protect SSSI 21D. This zone will also mitigate any loss of artifacts and material, and possibility of human injury at the station.

(b) The entire area north of the northern boundary of the SSSI to the line between the points of 62° 56' 13" S, 60° 36' 00" W and 62° 56' 16" S, 60° 35' 40" W. The west border is the high tide mark from 62° 56' 24" S, 60° 36' 00" W to 62° 56' 13" S, 60° 36' 00" W (Map 7.2).

iii. Whalers Bay:

(a) Although not prohibited, this management plan strongly recommends that none of the structures listed above (in 6-iii), are entered by visitors, thereby minimizing:

- damage caused by visitors to the structures.
- adverse effects caused by visitors to the cultural and historical aspects of the structures.
- injury to visitors.

(b) There are several areas of biological activity that may be susceptible to cumulative effects from visits, and are important to the monitoring plan. Therefore, it is strongly recommended that exclusion distances from the following areas are adhered to:

- 5 m from boilers (map 7.3, F) where there are nesting Dominican gulls.
- 5 m from the piles of barrel staves (map 7.3, J & K), where there are nesting Antarctic terns and Wilson storm petrels.
- 5 m from the rocks by Cathedral Crags (map 7.3, 6), where there are nesting pintado petrels.
- 5 m from the melt pond by the landing point (map 7.3, L), where there are groups of skuas.

(III) Research activities in the area

- five terrestrial SSSIs, 21 A-E (Map 7.4) are studied by the UK,
- two benthic SSSIs 27 A and 27 B (map 7.5) are studied by Chile.
- Oceanites (US) are continuing a site survey of parts of the area.
- U.S. is conducting oceanographic research in Port Foster
- Brazil has operated a temporary summer field camp 1997-99
- Argentine research base (*Decepcion*) in Port Foster
- Spanish research base (*Gabriell de Catilla*) in Port Foster
- Recent survey of whaling station done by Norway in 1992
- Recent BAS study in 1999

10 Installation, modification, or removal of structures and location of field camps:

Installation of new stations/refuges and modifications, or removal of already existing installations or other facilities in the Area, and location of field camps should be done only after consultation with the Parties that have active research programmes in the Area, and in conformity of Article 8 and Annex 1 of the Environmental Protocol (ATCM XX/WP 15, 1996).

11 Taking or harmful interference with native fauna and flora

Taking or harmful interference with native fauna and flora shall only occur in accordance with a permit issued under Article 3 of Annex 2 to the Protocol on Environmental Protection (ibid.).

12 Collection and removal of anything not brought into the area by the visitor:

In accordance with the Protocol on Environmental Protection souvenirs, specifically rocks, minerals, fossils, eggs, flora and fauna, or any other material not brought into the area by the visitor, shall not be collected in, or removed from, the Area (ATCM XX/WP15, 1996).

13 *Visits by tourists, and non-governmental expeditions*

i. The Party responsible for tour operators should ensure that tour operators, their staff, tourists, and other visitors are fully informed of, and comply with, the provisions of this management plan.
ii. Tourists and other visitors should be directed to stay within the boundaries described in the management plan.
iii. To avoid environmental impact, disturbance of wildlife and interference with research, landing at or entering zones listed above in; 8(I), 8(II) and 9(II), 9(III) should not take place, unless with an authorized permit.

14 *Disposal of waste*

- All waste from tourist or other visitor activities should be removed from the ASMA.
- Disposal of waste by scientific programmes within the ASMAs of this plan, shall comply with Annex III of the Protocol.

15 Maps, Charts, Photographs, and Pilot

(I) *Maps*: The UK has produced a topographical map of Deception Island, however the scale of 1:25,000 is insufficient for use in this plan.

(II) *Nautical Charts*: Several countries have produced charts of Deception Island. The most recent charts are:

i. British Admiralty Chart 3202, revised 1987. Scale; Deception Island, 1:50,000 and Whalers Bay and Neptune's Bellows, 1:12,5000.
ii. USA Chart 29103, revised 1972. Scale; Deception Island, 1: 50,000; Rada Pinguinera, 1:12,500; Whalers Bay and Neptune's Bellows, 1:12,500; Pendulum Cove, 1:12,500.
iii. Argentine chart 100, revised 1968. Deception Island, Scale; 1:50,000.
iv. Chilean chart 1402, revised 1953. Deception Island, Scale; 1:50,000.
v. Russian charts exist for this area, but are not readily available.

(III) Photographs: See page below in section 24.

(IV) British Admiralty Antarctic Pilot (1974, 1997):

i. Baily Head: "On both sides of Baily Head, there are small bays with sandy beaches where boats could be hauled up in calm weather. These bays provide access to a large penguin colony on the land-ward side of Baily Head". Depths are not charted within 910 m (5 cables) of shore, and outside that, the depths are over 100 fathoms (180 m), which would make anchoring unlikely.
ii. Pendulum Cove: "The Southern entrance point to Pendulum Cove is marked by a beacon (red and yellow tower). Anchorage can be obtained in depths of 20 to 30 m in muddy ashes, 182 m (1 cable) offshore. It is exposed to West and North-West winds, and the holding ground is poor".
iii. Whalers Bay: "Whalers Bay is entered between Fildes Point and Penfold Point, 1,001 m (5 1/2 cables) NW of a prominent metal anemometer tower 6 m high stands on the NW shore. A beacon stands 1,092 m (6 cables) ENE of the anemometer tower. Anchorage can be obtained in 64-91 m, loose cinders. The holding ground is poor, and vessels are liable to drag in strong winds". USA charts 29103 and British Admiralty 3202 warns of a badly fouled bottom in Whalers Bay.

16 *Notifications and reports*

- Visitors and Tour Leaders should complete the standard *site visit report* forms that are requested by NSF and IAATO.
- Monitoring personnel will submit the records of the season's activities to the *ASMA management* for analysis, and submit a report to the ATCM.
- Reports and recommendations will be presented to IAATO, and stored indefinitely.
- Reports and recommendations will be made available to interested parties, SCAR, CCAMLR, and COMNAP on request, to provide the documentation of human activities within the area.
- Parties proposing to conduct, support, or authorize research or other activities in the ASMAs of this plan, are requested to consult with the Parties currently conducting scientific research in the area as far in advance as practicable (ATCM XX/WP 15, 1996).

17 ***Period of Designation:*** Indefinitely

18 *Review procedures*

This management plan will be reviewed every five years, and updated as required. Proposed revisions will be provided to SCAR and other relevant components of the ATS for comment, and shall be submitted to the ATCP for adoption in accordance with established procedures (ibid.).

19 *Tourism*

The history of shipborne tourism in the Maritime Antarctic began in 1958-59, however the numbers of site-specific visits by tourists were not recorded until 1989-90. Table 7.1-7.3 illustrates the number of tourists visiting sites (excluding research stations) from the earliest records.

(i) **Baily Head**

Year	Number of visits	Number of tourist landed	Site ranking (excluding bases)
1989-90	5	455	8
1990-91	6	584	6
1991-92	18	1,497	7
1992-93	11	687	9
1993-94	10	1,008	8
1994-95	34	2,708	8
1995-96	23	1,406	9
1996-97	16	1,247	12
1997-98	19	1,395	8
total; 9 years	**142**	**10,987**	**6th (excluding bases)**

Table 7.1 The history of shipborne tourist visits to Baily Head. Source, IAATO (1998)

(ii) **Pendulum Cove**

Year	Number of visits	Number of tourist landed	Site ranking (excluding bases)
1989-90	7	587	5
1990-91	10	1,215	3
1991-92	19	2,011	5
1992-93	23	1,926	2
1993-94	33	3,159	3
1994-95	41	2,803	5
1995-96	42	3,492	4
1996-97	44	2,725	4
1997-98	31	3,426	4
total; 9 years	**250**	**21,354**	**3rd (excluding bases)**

Table 7.2 The history of shipborne tourist visits to Pendulum Cove. Source, IAATO (1998)

(iii) **Whalers Bay**:

Year	Number of visits	Number of tourist landed	Site ranking (excluding bases)
1989-90	17	1,682	1
1990-91	13	1,496	1
1991-92	23	2,899	1
1992-93	22	1,711	3
1993-94	37	3,480	2
1994-95	66	5,241	1
1995-96	67	5,033	1
1996-97	51	3,012	3
1997-98	60	5,344	1
total; 9 years	**356**	**29,898**	**1st (excluding bases)**

Table 7.3 The history of shipborne tourist visits to Whalers Bay. Source, IAATO (1998)

20 *History*

i. Baily Head: Little is known of the history of Baily Head. It is possibly named after one of the crew of *HMS Chanticleer* that visited the island in 1829. It is likely that the sealers used the beach, since fur seals are numerous by late summer. There are many accounts of crew from the whaling ships and the station at Whalers Bay, collecting penguin eggs at Baily Head.

ii. Pendulum Cove: In January 1829 the British captain Henry Foster, aboard *HMS Chanticleer,* sailed into Pendulum Cove to conduct scientific experiments for three months. The name of the cove is derived from the observations involving pendulums during this period. During the expedition, the *Chanticleer's* officers and crew wrote many descriptions and made drawings of Deception Island and Pendulum Cove. Many of the national exploratory and scientific, and pioneer whaling expeditions stopped at Deception Island to use its natural harbours and supplies from the whalers. Charcot used Pendulum Cove to water his vessel, *Pourquois Pas?* in 1910. From 1910-31 vessels involved in whaling factory operations at Whalers Bay resulted in Pendulum Cove being used for anchorage and fresh water supply. The Argentines, erected several refuge huts 1948-49 on Deception Island, including one in Pendulum Cove. The Chilean's established a station 18 February, 1955 in Pendulum Cove, and operated flying boats there from 1964-69. An eruption destroyed the base in 1969, without the loss of human life.

iii. Whalers Bay: The islands first documented use was by US sealers in 1820. It is alleged that US captain Pendleton spotted the mainland from Deception Island, and sent Nathaniel B Palmer to investigate what was later claimed to be a discovery of the Antarctic Continent, in 1820. The first map of Deception Island was drawn by Robert Fildes in 1829. Many national, exploratory and scientific, expeditions stopped at Whalers Bay for safe anchorage and fresh water supply, including Charcot in 1908-10 who named the bay after its use of the time. The first motorized flight in Antarctica occurred at Whalers Bay in 1928, by Sir Hubert Wilkins in a Vega monoplane. Britain opened a base in Whalers Bay in 1944, operating under a secret wartime code-name, *Tabarin.*

21 ***Physiography and Geology***: To be elaborated by monitoring program. See geological Map 7.6

22 ***Biology***: To be elaborated by monitoring program.

23 ***Recommended Reading***:

Alberts, F.G. (editor).1981. *Geographic Names of the Antarctic*. Washington, D.C: National Science Foundation.

Antarctic Treaty Consultative Meeting XIII. 1985. Final Report of the ATCM XIII. Brussels.

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Antarctic Treaty Consultative Meeting XVIII. 1994. Final Report of the ATCM XVIII. Kyoto.

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Antarctic Treaty Consultative Meeting XX. 1997. *Guide to the preparation of management plans for Antarctic Specially Protected Areas*. Working Paper 18. New Zealand.

British Antarctic Survey. 1997. *List of Protected Areas in Antarctica*. London: Foreign and Commonwealth Office,

Fuchs, V.E. 1970. Evolution of a Venture in Science: Operation Tabarin and the British Antarctic Survey. *Bulletin of Atomic Scientists*: vol. 26 (10): 75-80.

Killingbeck, J.B. 1977. *The Role of Deception Island in the Development of Antarctic Affairs*. Thesis for the Diploma in Polar Studies. Scott Polar Research Institute. University of Cambridge.

Hacquebord, L. 1992. Hector Station on Deception Island (South Shetland Islands, Antarctica), an environmental assessment study of a whaling station. *Circumpolar Journal* 1-2, vol. 7: 72-97.

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Naveen, R. 1997. *Compendium of Antarctic Peninsula Sites*. Chevy Chase: Oceanites.

Roobol, M.J. 1973 Historic Volcanic Activity at Deception Island. In: *British Antarctic Survey Bulletin*: vol. 32: 23-30.

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Smith, L.R.I. 1988. Botanical Survey of Deception Island. In: *British Antarctic Survey Bulletin*: vol. 78-81: 129-136. 1988.

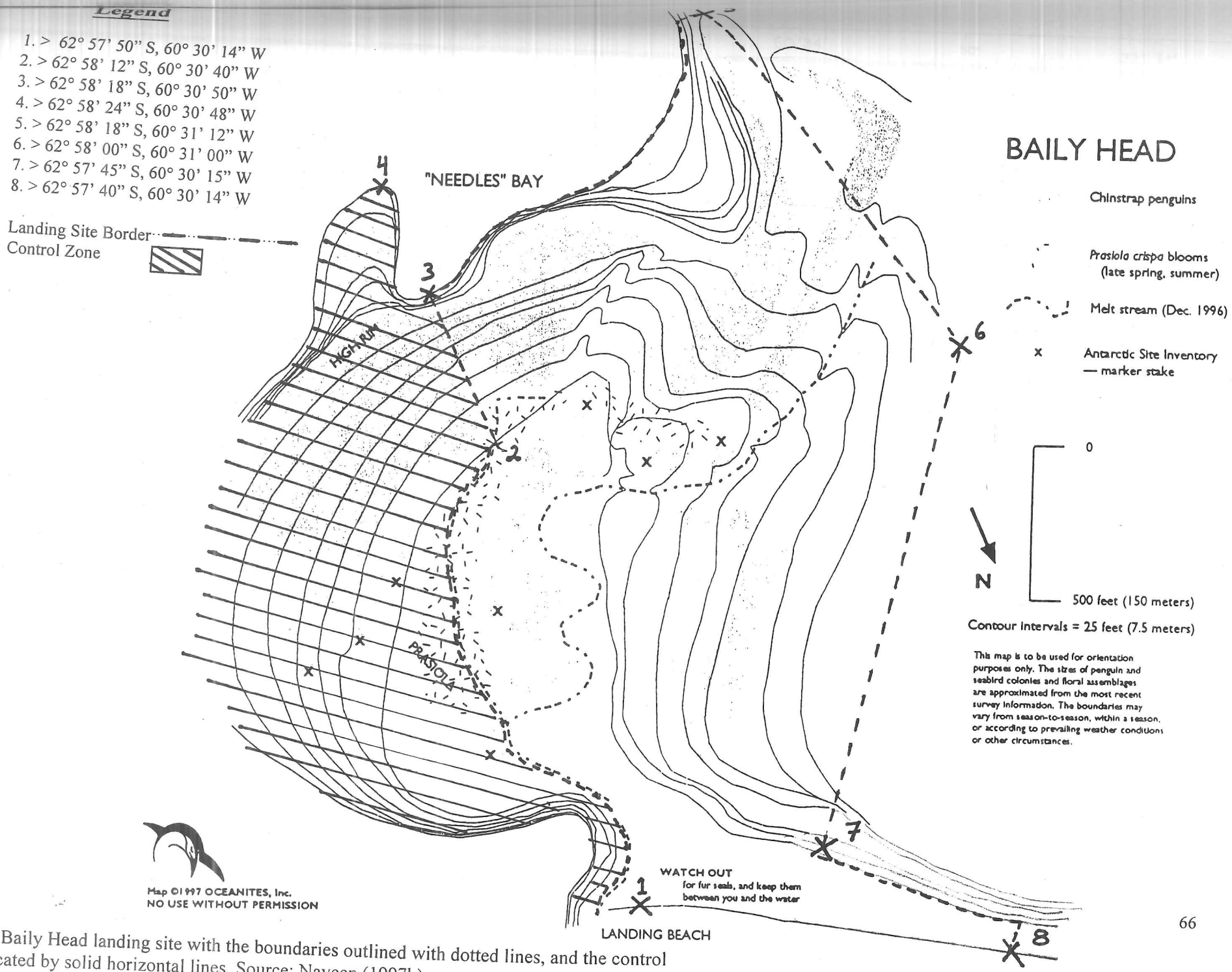
. The Hydrographer of the Navy. 1974. *The Antarctic Pilot, Fourth Edition*. Somerset.

The Hydrographer of the Navy. 1997. *The Antarctic Pilot, Fifth Edition*. Somerset.

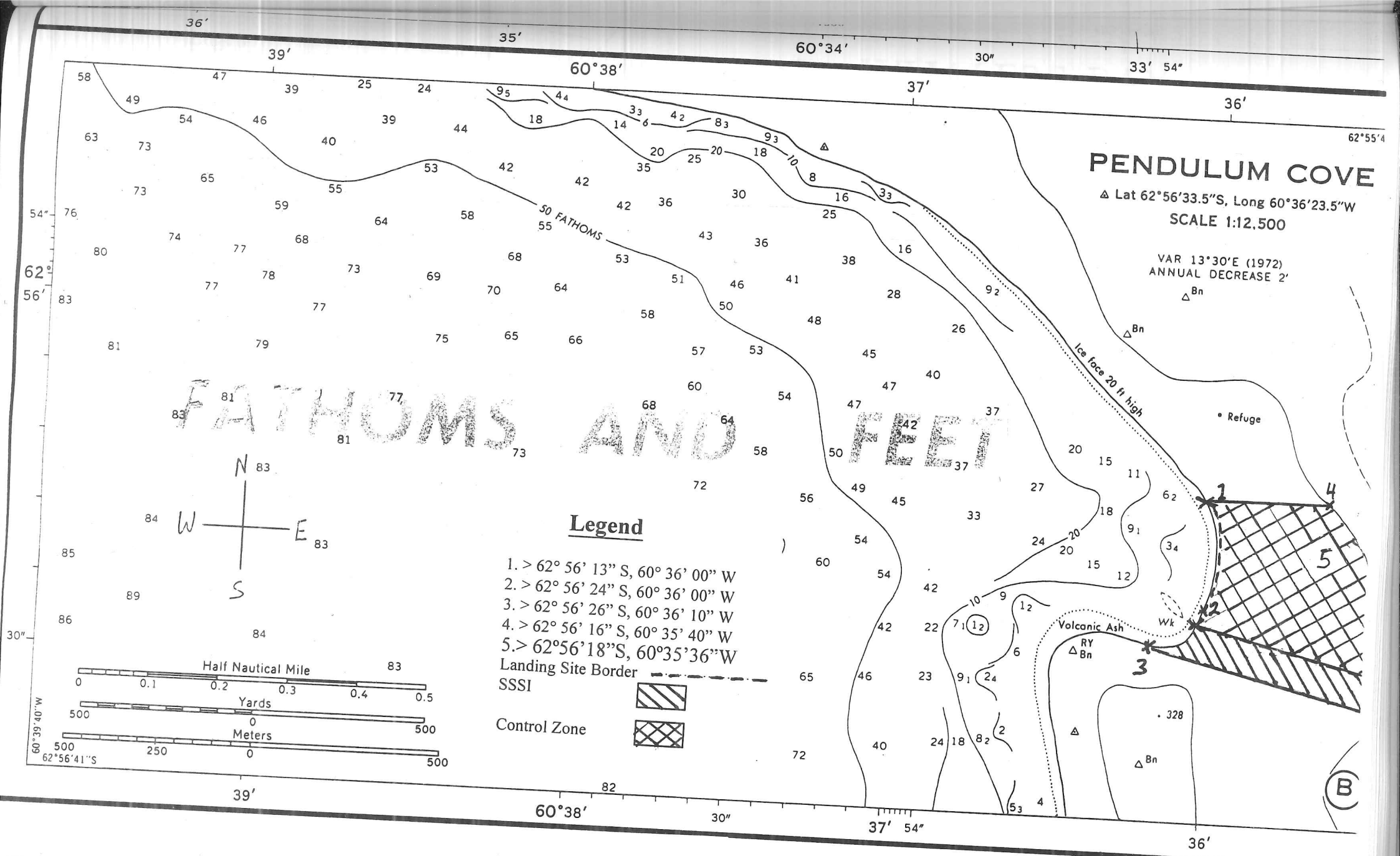
Webster, W., H., B. 1834. *Narrative of a Voyage to the Southern Atlantic Ocean*; in the years 1828-30, performed in H.M. Sloop *Chanticleer,* under the command of the late Captain Henry Foster, F.R.S &c. London: Richard Bentley.

24 Maps, tables, and photographs

See below.



Map 7.1 Baily Head landing site with the boundaries outlined with dotted lines, and the control area indicated by solid horizontal lines. Source; Naveen (1997b).



Map 7.2 Pendulum Cove landing site with the SSSI marked with diagonal lines, and the control area with crossed lines. Source; US Admiralty chart 29103 (1972).

Legend

Managed Area:

A. > Hanger	62° 58' 52" S, 60° 34' 28" W
B. > Magistrate Hut	62° 58' 50" S, 60° 34' 10" W
C. > Biscoe House	62° 58' 49" S, 60° 34' 07" W
D. > Old Barracks	62° 58' 51" S, 60° 33' 50" W
E. > Oil Tanks	62° 58' 52" S, 60° 33' 49" W
F. > Boilers	62° 58' 52" S, 60° 33' 54" W
G. > Dry Dock	62° 58' 55" S, 60° 33' 35" W
H.> Red Gable Roof	62° 58' 57" S, 60° 33' 35" W
I. > Well Hut	62° 58' 16" S, 60° 33' 13" W
J. > Barrel Stave Pile	62° 59' 07" S, 60° 33' 14" W
K. > Barrel Stave Pile	62° 59' 14" S, 60° 33' 09" W
L. > Melt Pond	62° 58' 56" S, 60° 33' 30" W
M. > Temp. Field Camp	62° 59' 16" S, 60° 32' 57" W

Landing Site Parameters:

1. > Kroner Lake	62° 59' 02" S, 60° 34' 48" W
2. > Boundary Point	62° 58' 56" S, 60° 34' 40" W
3. > Ronald Hill	62° 58' 32" S, 60° 34' 40" W
4. > Boundary Point	62° 58' 32" S, 60° 34' 08" W
5.> Neptune's Window	62° 59' 21" S, 60° 33' 00" W
6. > C. Crags (pintado's)	62° 59' 26" S, 60° 33' 24" W
7.> Boundary Point	62° 59' 21" S, 60° 33' 24" W
8. > Boundary Point	62° 58' 54" S, 60° 34' 04" W

Landing Site Border

SSSI

WHALERS BAY

SCALE 1:12 500

Projection — Gnomonic

HEIGHT – FEET

FOULED MOORINGS

Whalers Bay is fouled considerably by old moorings.

N W E S

Ronald Hill 338

HANGAR (disused)

Base Hut (disused)

Oil Tanks

Foul

Dock

RED AND YELLOW OUTCROP

RED AND WHITE GABLE END

Occasl hot springs

Kroner Lake

Penfold Pt

WHALERS BAY

Neptune's Window

Cathedral Crags

Fildes Pt

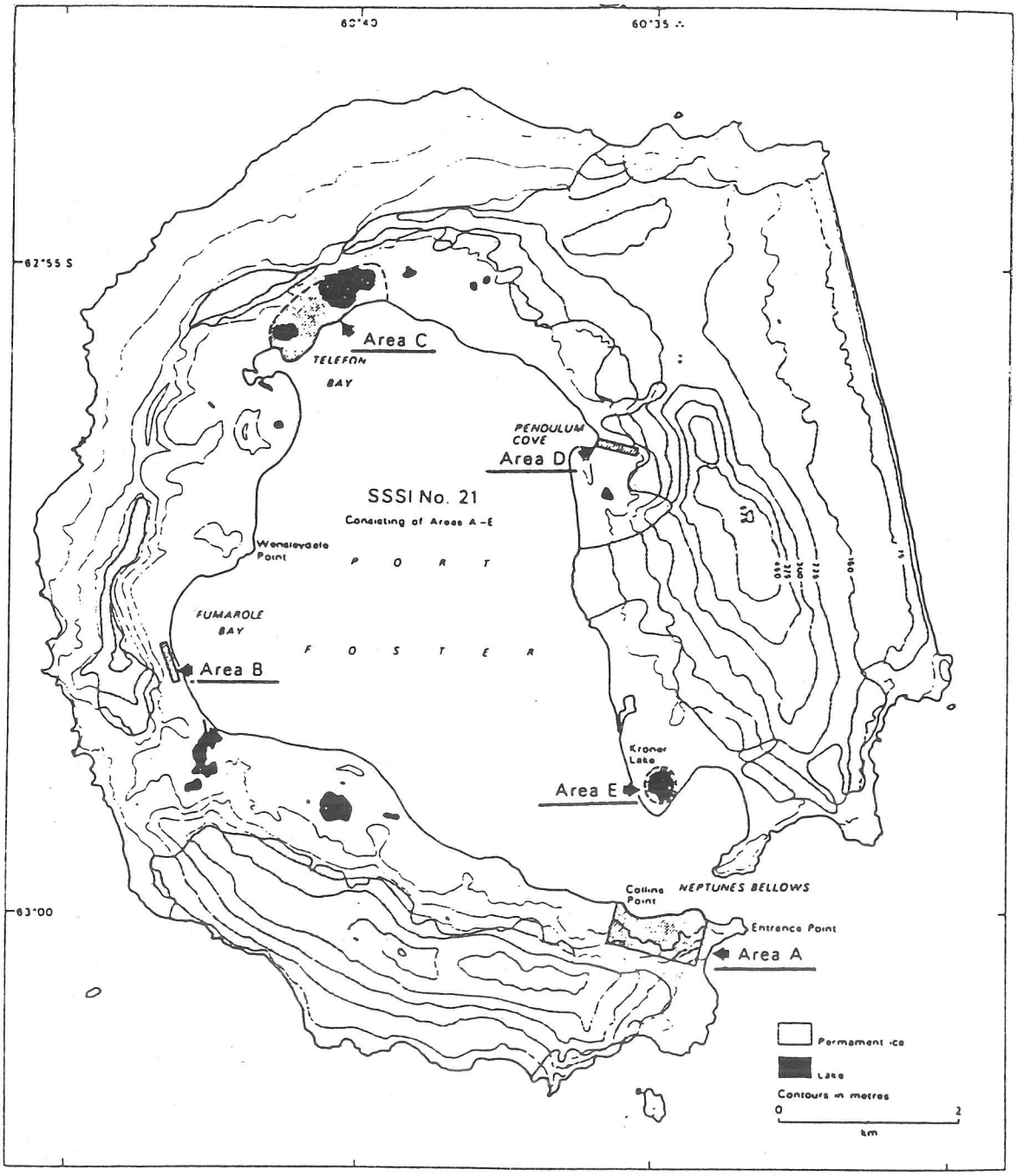
Petes Pillar (156)

Metres 100 0 500 1000 Metres

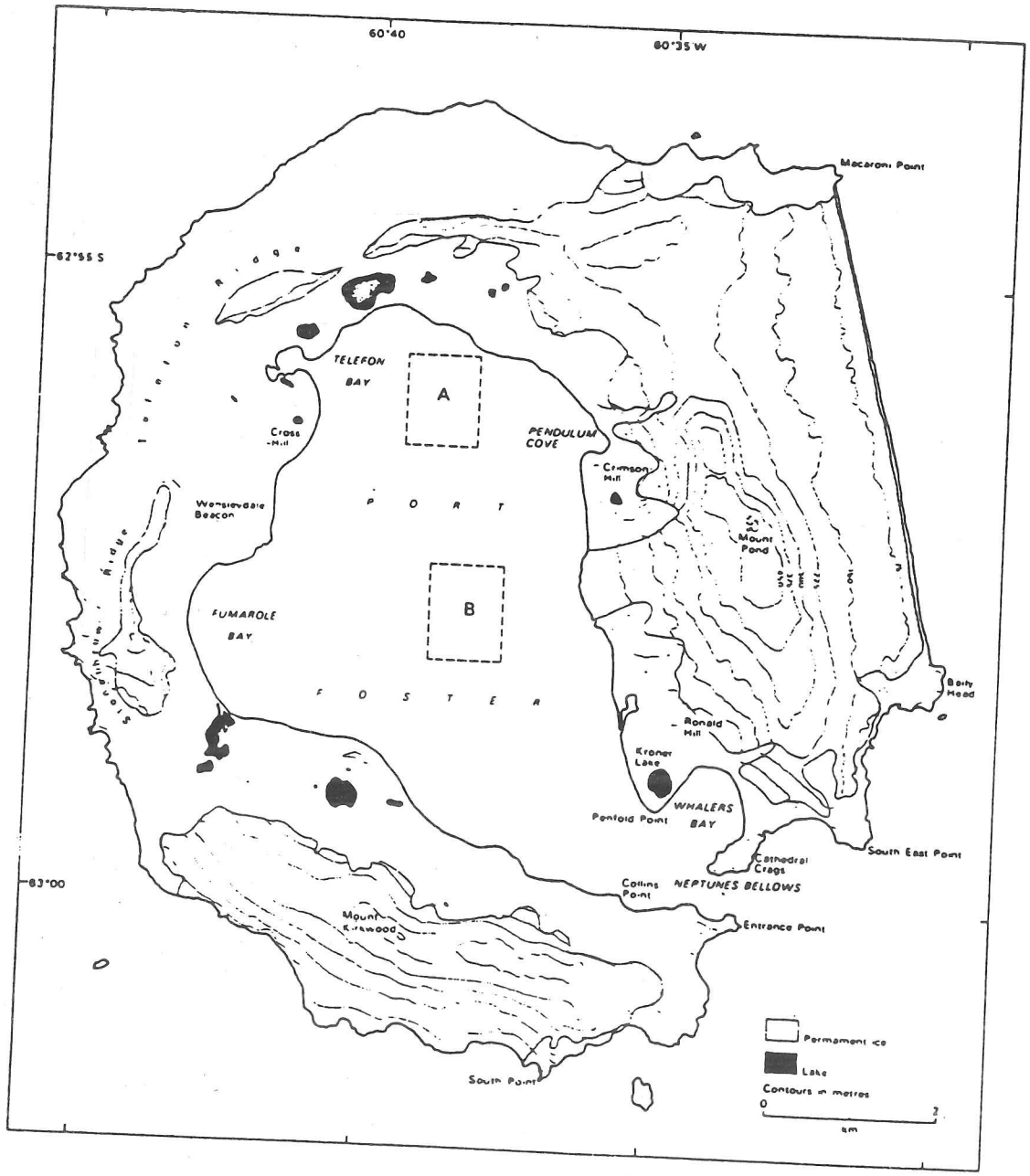
Feet 1000 500 0 1000 2000 3000 4000 Feet

1 0 5 10 Cables or 1 Sea Mile (60.95·1 m)

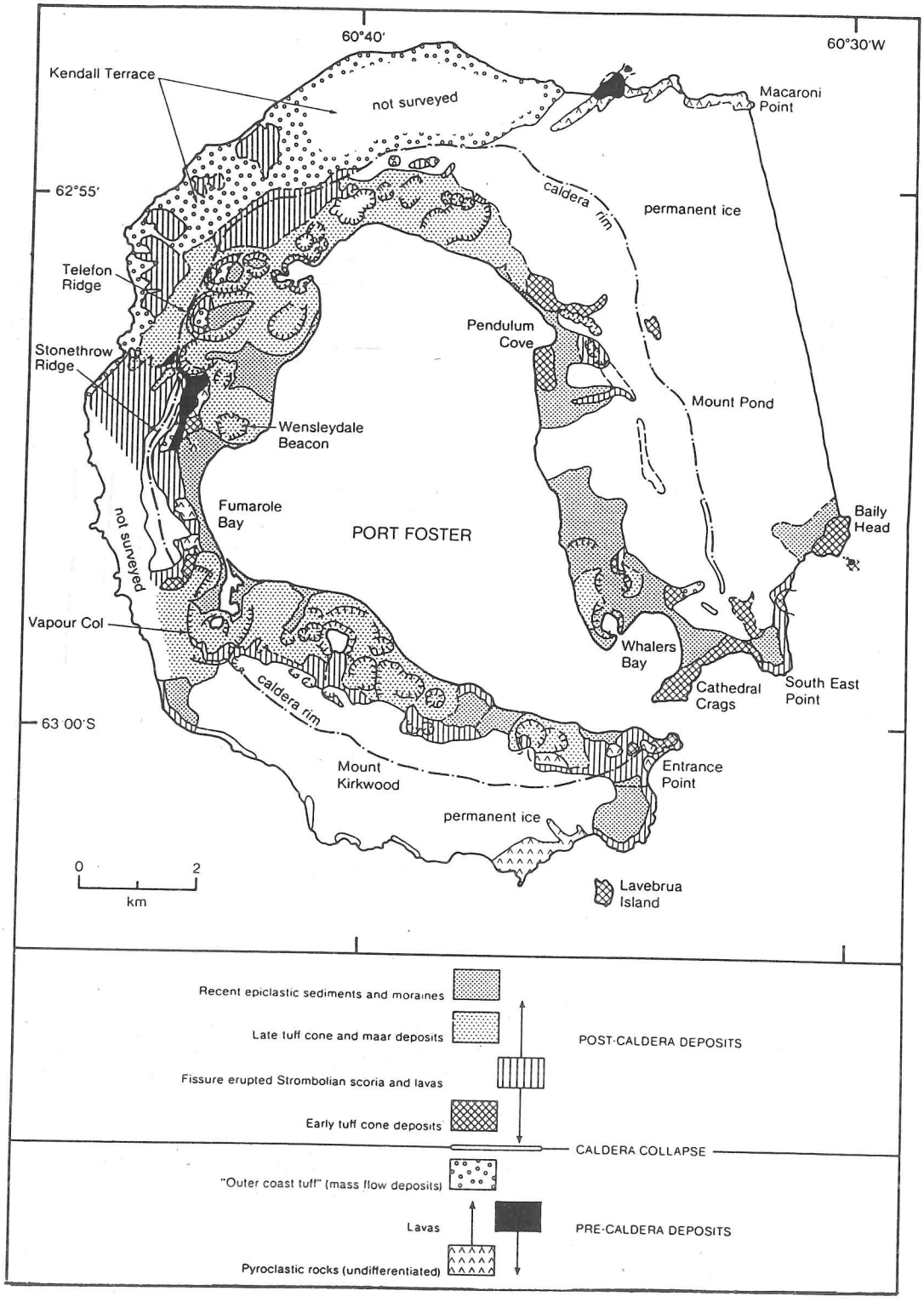
Map 7.3 Whalers Bay landing site. The various structures and restricted areas are indicated in the legend. Source; British Admiralty chart 3202 (1987).



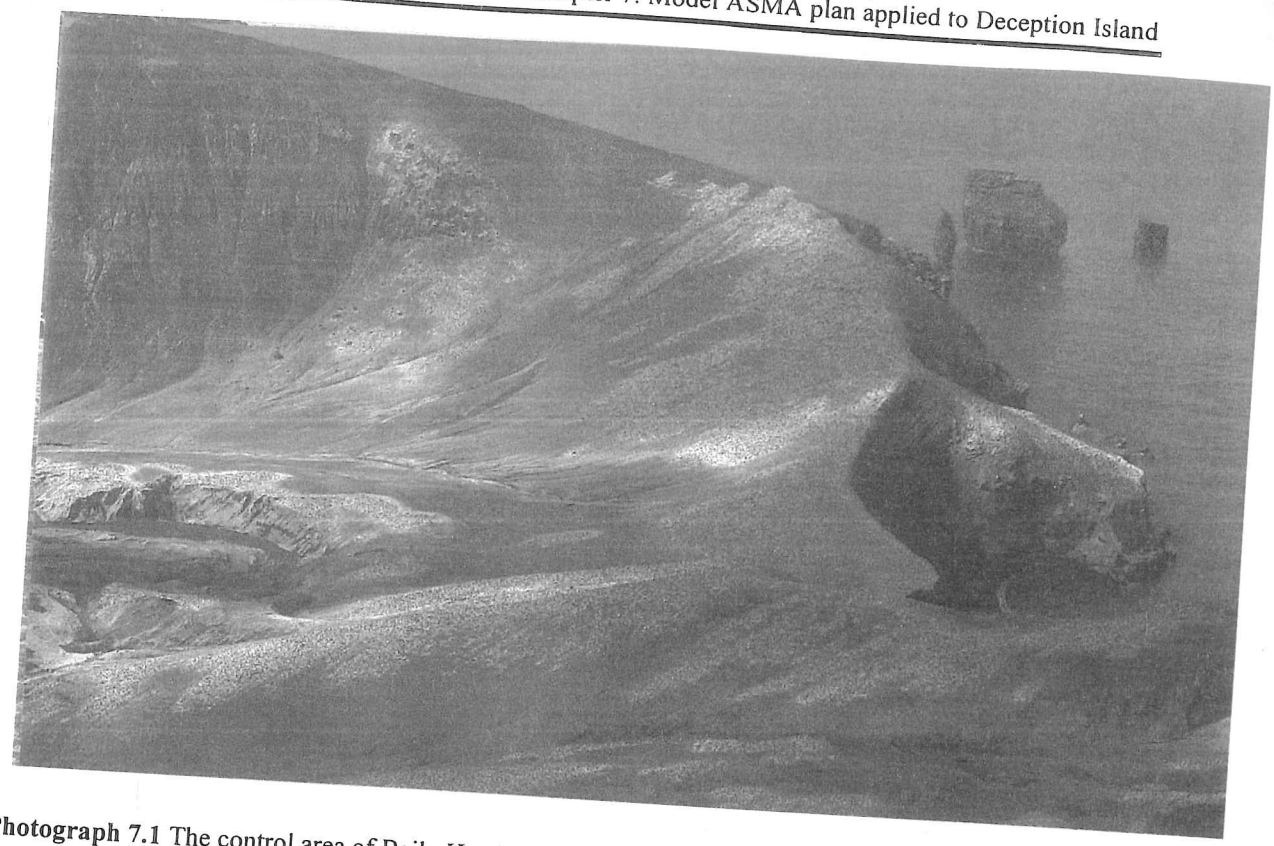
Map 7.4 Deception Island terrestrial SSSIs. Source: ATCMXIII (1985)



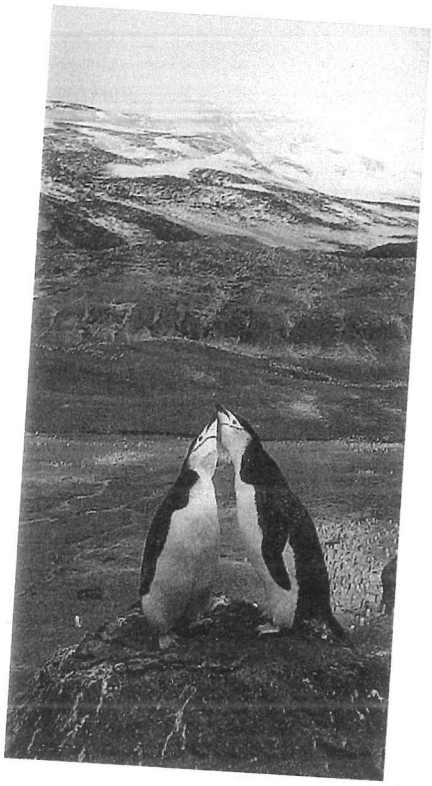
Map 7.5 Deception Island benthic SSSIs. Source: ATCM XIV (1987)



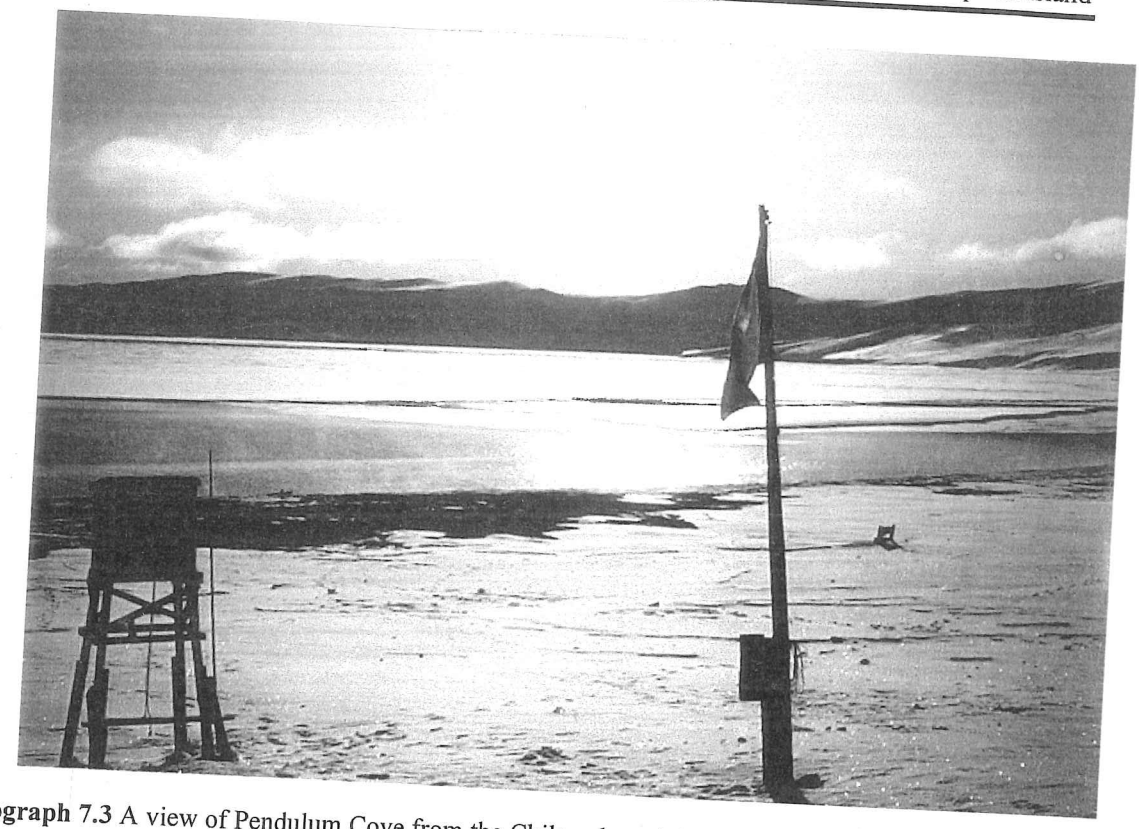
Map 7.6 Geological map of Deception Island. Source: Smellie (1988).



Photograph 7.1 The control area of Baily Head. Note the physical boundary, marked by the distinguishable melt stream. Source: Naveen (1997a)



Photograph 7.2 Chinstrap penguins at Baily Head. Note the *Prasiola crispa* in the background. Source: Naveen (1997a)



Photograph 7.3 A view of Pendulum Cove from the Chilean base (circa 1962). Source: John Killingbeck

Photograph 7.4 The warm waters in Pendulum Cove. Source: Bob Headland .

Photograph 7.5 The Old Barracks at Whalers Bay. Source: Dr. Kim Crosbie

Photograph 7.6 The Boilers at Whalers Bay. Source: Dr. Kim Crosbie.

Photograph 7.7 Aireal photograph of Whalers Bay. Source: Brent Houston, in: Naveen (1997a)

Photograph 7.7 Aireal photograph of Whalers Bay. Source: Brent Houston, in: Naveen (1997a)

PLACE—DECEPTION ISLAND, SOUTH SHETLAND ISLANDS. LAT. 62° 59′ S. LONG. 60° 34′ W. Height above Mean Sea Level—8 m (26 ft)

WMO. No. 88938

Climatic Table compiled from 10 to 20 Years' Observations, 1944 to 1963

Month	Pressure at M.S.L. Mean	Air temperature: Mean daily max.	Air temperature: Mean daily min.	Air temperature: Highest in each month	Air temperature: Lowest in each month	Relative humidity 0800	Relative humidity 1400	Mean Cloud Amount 0800	Mean Cloud Amount 1400	Precipitation: No. of days with ▣	Precipitation: No. of days with ●	Wind direction ø: Percentage of observations from N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm	Wind direction ø: Percentage of observations from N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm	Mean wind speed ø	Mean wind speed —	No. of days with Gale	No. of days with Fog
	mb.	°C.	°C.	°C.	°C.	%	%	Oktas																							Knots			
January	990	+ 2	− 1	11	− 7	83	79	7	7	7	14	5	25	10	4	1	12	13	25	5										12		1	4
February	991	+ 3	− 1	9	− 8	85	82	7	7	9	13	6	17	6	3	2	11	17	31	7										13		1	5
March	992	+ 2	− 2	9	−11	88	85	7	7	11	14	8	23	6	2	1	10	13	28	9										14		2	7
April	991	0	− 5	8	−17	88	86	7	7	9	19	6	17	6	3	1	12	16	33	6										15		3	8
May	994	− 3	−10	6	−21	85	84	7	7	7	17	6	19	8	6	2	13	13	25	8										15		4	8
June	994	− 5	−13	5	−27	87	85	7	7	4	18	5	19	7	3	2	14	16	28	6										16		5	9
July	995	− 7	−15	5	−28	86	86	6	6	5	17	6	20	6	3	2	11	15	28	9										16		5	10
August	995	− 6	−13	6	−28	86	87	6	6	4	19	7	19	6	3	1	9	15	34	6										15		4	8
September	994	− 2	− 9	5	−26	88	87	7	7	4	21	8	14	3	2	2	12	16	35	8										15		4	7
October	991	0	− 5	6	−24	87	86	7	7	5	21	6	16	4	2	1	12	18	36	5										16		3	8
November	988	+ 1	− 3	6	−14	86	84	7	7	5	19	5	18	9	3	2	10	16	30	7										14		2	6
December	991	+ 1	− 2	8	− 8	84	82	7	7	6	18	6	22	9	4	2	11	16	25	5										13		1	4
Means	992	− 1	− 6	− *	−**	86	84	7	7	—	—	6	19	6	3	2	12	15	30	7										15	—	—	—
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—										—	—	35	84
Extreme Values	—	—	—	11†	−28††	—	—	—	—	76	210	—	—	—	—	—	—	—	—	—										—	—	—	—
No. of years' observations				18								10																		18		18	18

*Mean of highest each year.
**Mean of lowest each year.

†Highest recorded temperature.
††Lowest recorded temperature.

ø All observations.
▣Rain or drizzle.
●Snow or sleet.

Table 7.1 Climatic information for Deception Island. Source: Antarctic Pilot, Fourth Edition (1974)

Chapter 8

Summary of conclusions

8.1 Introduction

With expected increases in the number of visitors, the threat of human disturbance at tourist landing sites is an increasing problem. Cumulative effects and visits by persons with little or no comprehension of the regulations and Guidelines could prove harmful to the environment and scientific research.

Tourism is accepted by the ATS, and enjoys the same freedom of any other human activity in Antarctica. The Treaty has laconically dealt with tourism issues sporadically since 1966, in the form of regulatory controls. The Protocol is a comprehensive regulatory instrument concerning environmental protection under which tourism must comply. IAATO members ensure their operations comply with these and have established their own Guidelines and Codes of Conduct that are designed to further minimize adverse effects. However, their site-specific management is inconsistent. Additionally, not all visitors to Maritime Antarctic landing sites are IAATO members. Non-IAATO visitors and private voyages (*e.g.* yachts) have demonstrated that regulatory controls and legally binding instruments are not sufficient to ensure effective compliance.

It was demonstrated that when tour leaders were provided with information about the regulations and management plan of a landing site, they were generally accepted as being effective. Additionally, if site specific information were made available to those intending to visit, awareness would increase the chances of compliance and thus minimizes potential adverse effects. Thus, it is probable that other visitors and private expeditions would be just as effective if provided with the same information. Therefore a visitor to an ASMA with prior knowledge of the management plan, regulations and Guidelines, could be considered as effective, active management for the site.

Annex V of the Protocol provides a procedure for managing tourist landing sites. Area protection and management in Annex V offers the opportunity to regulate and monitor visitors by managing their activities at landing sites. ASMAs are more appropriate than ASPAs for this because they require active management. This is to

ensure the relevant regulations, Guidelines, and Codes of Conduct are observed.

A consequence of the lack of sovereign authority is that the enforcement powers that were shared by wilderness management plans, in other parts of the world, are not applicable in the Antarctic. Since it is unlikely that ASMAs will have on-site enforcement personnel, self-regulation will be the only protection afforded. Therefore, it is paramount that management plans are comprehensive, easy to understand, and readily available. Various methods of ensuring this information is received prior to a landing is to:

(a) place signs at the landing point of sites which explains that the site is an ASMA, and entry is conditional on knowledge of the management plan, and

(b) ensure that copies of the management plan is available at ports of departure. Currently all vessels leave for the Maritime Antarctic from a port of an ATCP member.

The lack of undisputed sovereignty authority in the ATS would prevent the six plans from being effectively implemented in their entirety, to an ASMA. However, common criteria were present in all of them and were thus recognized as essential for preparing a plan. These criteria were also found to exist in the Annex V requirements for an ASMA management plan. Thus, An ASMA management plan has all the criteria that other plans consider essential, except for points prevented by sovereignty issues. The disputed sovereignty of Antarctica prevents a management plan and its protective devices to be as effective as it could be in other parts of the world.

The ATS has agreed to implement uniform formats for Annex V management plans. Although an ASPA format has been established, SCAR has not yet recommended an ASMA plan for a uniform model. Section 7.2 presented a plan that accommodates three separate sites and conforming to SCAR recommendations; demonstrating it could be used as a model for a uniform format.

The history of environmental damage resulting from tourism in the Maritime Antarctic has been described as relatively benign, however there have been few studies to substantiate this. By incorporating a monitoring program into an ASMA management plan, the effects that visitors have on a site can be understood. Decisions can then be made from scientific data whether activities are having a deleterious effect, and can then be managed accordingly.

This thesis has analyzed the effects of tourism in the Maritime Antarctic and

detected a problem which is expected to get worse. The regulations of the ATS, hortatory requirements, and the study of six management plans were evaluated to determine whether an effective solution to managing tourist landing sites is possible. This thesis has indicated that it is possible under the ATS regulations to design an effective method for managing tourist landing sites, and has proposed a management plan for an ASMA designation to demonstrate this. Furthermore, the qualities of Deception Island make it an ideal location to implement this model plan.

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Text of the Antarctic Treaty

The Governments of Argentina, Australia, Belgium, Chile, the French Republic, Japan, New Zealand, Norway, the Union of South Africa, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, and the United States of America,

Recognizing that it is in the interest of all mankind that Antarctica shall continue for ever to be used for peaceful purposes and shall not become the scene or object of international discord;

Acknowledging the substantial contributions to scientific knowledge resulting from international cooperation in scientific investigation in Antarctica;

Convinced that the establishment of a firm foundation for the continuation and development of such cooperation on the basis of freedom of scientific investigation in Antarctica as applied during the International Geophysical Year accords with the interests of science and the progress of all mankind;

Convinced also that a treaty ensuring the use of Antarctica for peaceful purposes only and the continuance of international harmony in Antarctica will further the purposes and principles embodied in the Charter of the United Nations;

Have agreed as follows:

Article I

1. Antarctica shall be used for peaceful purposes only. There shall be prohibited, *inter alia*, any measure of a military nature, such as establishment of military bases and fortifications, the carrying out of military maneuvers, as well as the testing of any type of weapon.
2. The present Treaty shall not prevent the use of military personnel or equipment for scientific research or for any other purpose.

Article II

Freedom of scientific investigation in Antarctica and cooperation toward that end, as applied during the International Geophysical Year, shall continue, subject to the provisions of the present Treaty.

Article III

In order to promote international cooperation in scientific investigation in Antarctica, as provided for in Article II of the present Treaty, the Contracting Parties agree that, to the greatest extent feasible and practicable:

(a) information regarding plans for scientific programs in Antarctica shall be exchanged to permit maximum economy of and efficiency of operations;
(b) scientific personnel shall be exchanged in Antarctica between expeditions and stations;
(c) scientific observations and results from Antarctica shall be exchanged and made freely available.

Article IV

1. Nothing contained in the present Treaty shall be interpreted as:
   (a) a renunciation by any Contracting Party of previously asserted rights of or claims to territorial sovereignty in Antarctica;
   (b) a renunciation or diminution by any Contracting Party of any basis of claim to territorial sovereignty in Antarctica which it may have whether as a result of its activities or those of its nationals in Antarctica, or otherwise;
   (c) prejudicing the position of any Contracting Party as regards its recognition or non-recognition of any other State's rights of or claim or basis of claim to territorial sovereignty in Antarctica
2. No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.

Article V

1. Any nuclear explosions in Antarctica and the disposal there of radioactive waste material shall be prohibited.
2. In the event of the conclusion of international agreements concerning the use of nuclear energy, including nuclear explosions and the deposal of radioactive waste material, to which all of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX are Parties, the rules established under such agreements shall apply in Antarctica.

Article VI

The Provisions of the present Treaty shall apply to the area south of 60° South Latitude, including all ice shelves, but nothing in the present Treaty shall prejudice or in any way affect the rights, or exercise of the rights, of any State under international law with regard to the high seas within that area.

Article VII

1. In order to promote the objectives and ensure the observance of the provisions of the present Treaty, each Contracting Party whose representatives are entitled to participate in the meetings referred to in Article IX of the Treaty shall have the right to designate observers to carry out any inspection provided for by the present Article. Observers shall be nationals of the Contracting Parties which designate them. The names of observers shall be communicated to every other Contracting Party having the right to designate observers, and like notice shall be given of the termination of their appointment.
2. Each observer designated in accordance with the provision of paragraph 1 of this Article shall have complete freedom of access at any time to any areas of Antarctica.
3. All areas of Antarctic, including all stations, installations and equipment within those areas, and all ships and aircraft at points of discharging or embarking cargoes or personnel in Antarctica, shall be open at all times to inspection by any observers designated in accordance with paragraph 1 of this Article.
4. Aerial observation may be carried out at any time over any or all areas of Antarctica by any of the Contracting Parties having the right to designate observers.
5. Each Contracting Party shall, at the time when the present Treaty enters into force for it, inform the other Contracting Parties, and thereafter shall give them notice in advance, of
   (a) all expeditions to and within Antarctica, on the part of its ships or national, and all expeditions to Antarctica organized in or proceeding from its territory;
   (b) all stations in Antarctica occupied by its nationals; and
   (c) any military personnel or equipment intended to be introduced by it into Antarctica subject to the conditions prescribed in paragraph 2 of Article I of the present Treaty.

Article VIII

1. In order to facilitate the exercise of their functions under the present Treaty, and without prejudice to the respective positions of the Contracting Parties relating to jurisdiction over all other persons in Antarctica, observers designated under paragraph 1 of Article VII and scientific personnel exchanged under sub-paragraph (b) of Article III of the Treaty, and members of the staffs accompanying any such persons, shall be subject only to the jurisdiction of the Contracting Party of which they are nationals in respect of all acts or omissions occurring while they are in Antarctica for the purpose of exercising their functions.
2. Without prejudice to the provisions of paragraph 1 of this Article, and pending the adoption of measures in pursuance of sub-paragraph 1 (e) of Article IX, the Contracting Parties concerned in any case of dispute with regard to the exercise of jurisdiction in Antarctica shall immediately consult together with a view to reaching a mutually acceptable solution.

Article IX

1. Representatives of the Contracting Parties named in the preamble to the present Treaty shall meet at the City of Canberra within two months after the date of entry into force of the Treaty, and thereafter at suitable intervals and places, for the purpose of exchanging information, consulting together on matters of common interest pertaining to Antarctica, and formulation and considering, and recommending to their Governments, measures in furtherance of the principles and objectives of the Treaty, including measures regarding:
   (a) use of Antarctica for peaceful purposes only;
   (b) facilitation of scientific research in Antarctica;
   (c) facilitation of international cooperation in Antarctica;
   (d) facilitation of the exercise of the rights of inspection provided for in Article VII

(e) of the Treaty
(f) questions relating to the exercise of jurisdiction in Antarctica;
(g) preservation and conservation of living resources in Antarctica.

2. Each Contracting Party which has become a present Party to the present Treaty by accession under Article XIII shall be entitled to appoint representatives to participate in the meetings referred to in paragraph 1 of the present Article, during such times as that Contracting Party demonstrates its interest in Antarctica by conducting substantial research activity there, such as the establishment of a scientific station or the dispatch of a scientific expedition.

3. Reports from the observers referred to in Article VII of the present Treaty shall be transmitted to the representatives of the Contracting Parties participating in the meetings referred to in paragraph 1 of the present Article.

4. The measures referred to in paragraph 1 of this Article shall become effective when approved by all the Contracted Parties whose representatives were entitled to participate in the meetings held to consider those measure.

5. Any or all the rights established in the present Treaty may be exercised as from the date of entry into force of the Treaty whether or not measures facilitating the exercise of such rights have been proposed,, considered, or approved in this Article.

Article X

Each of the Contracting Parties undertakes to exert appropriate efforts, consistent with the Charter of the United Nations, to the end that no one engages in any activity in Antarctica contrary to the principle or purposes of the Treaty.

Article XI

1. If any dispute arises between two or more of the Contracting Parties concerning the interpretation or application of the present Treaty, those Contracting Parties shall consult among themselves with a view to having the dispute resolved by negotiation, inquiry, mediation, conciliation, arbitration, judicial settlement or other peaceful means of their own choice.

2. Any dispute of this character not so resolved, with the consent, in each case, of all parties to the dispute, be referred to the International Court of Justice for settlement; but failure to reach agreement on reference to the International Court shall not absolve parties to the dispute from the responsibility of continuing to seek to resolve it by any of the various means referred to in paragraph 1 of this Article.

Article XII

1.

(a) The present Treaty may be modified or amended at any time by unanimous agreement of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX. Any such modification or amendment shall enter into force when the depository Government has received notice from all Contracting Parties that they have ratified it.
(b) Such modification or amendment shall thereafter enter into force as to any other Contracting Party when notice of ratification by it has been received by the depository Government. Any such Contracting Party from which no notice of ratification is received within a period of two years from the date of entry into force of the modification or amendment in accordance with the provisions of sub-paragraph 1(a) of this Article shall be deemed to have withdrawn from the present Treaty on the date of the expiry of such period.

2.

(a) If after the expiry of thirty years from the date of entry into force of the present Treaty, any of the Contracting Parties whose representatives are entitled to participate in the meetings provided under Article IX so requests by a communication addressed to the depository Government, a Conference of all the Contracting Parties shall be held as soon as practicable to review the operation of the Treaty.
(b) Any modification or amendment to the present Treaty which is approved at such a Conference by a majority of the Contracting Parties there represented, including a majority of those whose representatives are entitled to participate in the meetings provided for under Article IX, shall be communicated by the depository Government to all Contracted Parties immediately after the termination of the Conference and shall enter into force in accordance with the provision of paragraph 1 of the present Article.
(c) If any such modification or amendment has not entered into force in accordance with the

provisions of sub-paragraph 1(a) of this Article within a period of two years after the date of its communication to all Contracted Parties, any Contracted Party may at any time after the expiration of that period give notice to the depository Government of its withdrawal from the present Treaty; and such withdrawal shall take effect two years after the receipt of the notice by the depository Government.

Article XIII

1. The present Treaty shall be subject to ratification by the signatory States. It shall be open for accession by any State which is a member of the United Nations, or by any other State which may be invited to accede to the Treaty with the consent of all the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX of the Treaty.
2. Ratification of or accession to the present Treaty shall be effected by each State in accordance with it constitutional processes.
3. Instruments of ratification and instruments of accessions shall be deposited with the Government of the United States of America, hereby designated as the depository Government.
4. The depository Government shall inform all signatory and acceding States of the entry date of each deposit of an instrument of ratification or accession, and the date of entry into force of the Treaty and of any modification or amendment thereto.
5. Upon the deposit of instruments of ratification by all signatory States, the present Treaty shall enter into force for those States which have deposited instruments of accession. Thereafter the Treaty shall enter into force for any acceding State upon deposit of its instruments of accession.
6. The present Treaty shall be registered by the depositary Government pursuant to Article 102 of the Charter of the United Nations.

Article XIV

The present Treaty, done in English, French, Russian and Spanish languages, each version being equally authentic, shall be deposited in the archives of the Government of the United States of America, which shall transmit duly certified copies thereof to the Governments of the signatory and acceding States.

Entered into force 23 June, 1961

ANNEX V
TO THE PROTOCOL ON ENVIRONMENTAL PROTECTION TO THE ANTARCTIC TREATY

AREA PROTECTION AND MANAGEMENT

Article 1
Definitions
For the purpose of this Annex:

(a) "appropriate authority" means any person or agency authorized by a Party to issue permits under this Annex;
(b) "permit" means a formal permission in writing issued by an appropriate authority;
(c) "Management Plan" means a plan to manage the activities and protect the special value or values in an Antarctic Specially Protected Area or an Antarctic Specially Managed Area.

Article 2
Objectives

For the purposes set out in this Annex, any area, including any marine area, may be designated as an Antarctic Specially Protected Area or an Antarctic Specially Managed Area. Activities in those areas shall be prohibited, restricted, or managed in accordance with Management Plans adopted under the provisions under this Annex.

Article 3
Antarctic Specially Protected Areas
1. Any area including any marine area may be designated as an Antarctic Specially Protected Area to protect outstanding environmental, scientific, historic, aesthetic, or wilderness values, or ongoing research.
2. Parties shall seek to identify, within a systematic environmental-geographical framework, and to include in the series of Antarctic Specially Protected Areas:

(a) areas kept inviolate from human interference so that future comparisons may be possible with localities that have been affected by human activities;
(b) representative examples of major terrestrial, including glacial and aquatic, ecosystems and marine ecosystems;
(c) areas with important and unusual assemblages of species, including major colonies of breeding native birds or mammals;
(d) the type, locality, or only known habitat of any species;
(e) areas of particular interest to on-going or planned scientific research;
(f) areas of outstanding geological, glaciological, or geomorphological features;
(g) sites or monuments of recognized historic value; and
(h) such other areas as may be appropriate to protect the values set out in paragraph 1 above.

3. Specially Protected Areas and Sites of Special Scientific Interest designated as such by past Antarctic Treaty Consultative Meetings are hereby designated as Antarctic Specially Protected Areas and shall be re-named and re-numbered accordingly.
4. Entry into an Antarctic Specially Protected Area shall be prohibited except in accordance with a permit issued under Article 7.

Article 4
Antarctic Specially Managed Area
1. Any area, including any marine area, where activities are being conducted or may in the future be conducted, may be designated an Antarctic Specially Managed Area to assist in the planning and co-ordination of activities, avoid possible conflicts, improve co-operation between parties or minimize environmental impacts.
2. Antarctic Specially Managed Areas may include:

(a) areas where activities pose risk of mutual interference or cumulative environmental impacts; and
(b) sites or monuments of recognized historic value.

3. Entry into an Antarctic Specially Managed Area shall not require a permit.

4. Notwithstanding paragraph 3 above, and Antarctic Specially Managed Area may contain one or more Antarctic Specially Protected Areas, entry into which shall be prohibited except in accordance with a permit issued under Article 7.

Article 5
Management Plans

1. Any Party, the Committee, the Scientific Committee for Antarctic Research or the Commission for the Conservation of Antarctic Marine Living Resources may propose an area as designation as an Antarctic Specially Protected Area or an Antarctic Specially Managed Area by submitting a proposed Management Plan to the Antarctic Treaty Consultative Meeting.

2 The area proposed for designation shall be of sufficient size to protect the values for which the special protection or management is required.

3. Proposed Management Plan shall include, as appropriate:

(a) a description of the values for which special protection or management is required;
(b) a statement of the aims of the Management Plan for the protection or management of those values;
(c) management activities which are to be undertaken to protect the values for which special protection or management is required;
(d) a period of designation, if any;
(e) a description of the area, including:
  i. the geographical co-ordinates, boundary markers and natural features that delineate the area;
  ii. access to the area by land, sea, or air including marine approaches, pedestrian and vehicular routes within the area, and aircraft routes and landing areas;
  iii. the location of structures, including scientific stations, research or refuge facilities, both within the area and near to it; and
  iv. the location in or near the area of other Antarctic Specially Protected or Antarctic Specially Managed Areas designated under this Annex, or other protected areas designated in accordance with measures adopted under other components of the Antarctic Treaty System;
(f) the identification of zones within this area, in which activities are to be prohibited, restricted or managed for the purpose of achieving the aims and objectives referred to in paragraph (b) above;
(g) maps and photographs that show clearly the boundaries of the area in relation to surrounding features and key features in the area;
(h) supporting documentation;
(i) in respect of an area proposed as an Antarctic Specially Protected Area, a clear description of the conditions under which permits may be granted by the appropriate authority regarding;
  i. access to and movement within or over the area;
  ii. activities which are or may be conducted within the area, including restrictions on time and place;
  iii. the installation, modification, or removal of structures;
  iv. the location of field camps;
  v. restrictions on materials or organisms which may be brought into the area;
  vi. the taking of or harmful interference with native flora and fauna;
  vii. the collection or removal of anything not brought into the area by the permit holder;
  viii. measures that may be necessary to ensure that the aims and objectives of the Management Plan can continue to be met; and
  ix. requirements for reports to be made to the appropriate authority regarding visits to the area;
(j) in respect of an area proposed for designation as an Antarctic Specially Managed Area, a code of conduct regarding;
  i. access to and movement within or over the area;
  ii. activities which are, or may be conducted within the area, including restrictions on time and place;
  iii. the installation, modification, or removal of structures;

iv. the location of field camps;
v. the taking of or harmful interference with native flora and fauna;
vi. the collection or removal of anything not brought into the area by the visitor;
vii. the disposal of waste; and
viii. any requirements for reports to be made to the appropriate authority regardingvisits to the area; and

(k) provisions relating to the circumstances in which Parties should seek to exchange information in advance of activities which they propose to conduct.

Article 6
Designation Procedures

1. Proposed Management Plans shall be forwarded to the Committee, the Scientific Committee on Antarctic Research and, as appropriate, to the commission for the Conservation of Antarctic Marine Living resources. In formulating its advice to the Antarctic Treaty Consultative Meeting, the committee shall take into account any comments provided by the Scientific Committee on Antarctic Research and, as appropriate, by the Commission for the Conservation of Antarctic Marine Living Resources. Thereafter, Management Plans may be approved by the Antarctic Treaty Consultative Parties by a measure adopted in an Antarctic Treaty Consultative Meeting in accordance with Article IX (1) of the Antarctic Treaty. Unless the measure specifies otherwise, the Plan shall be deemed to have been approved 90 days after the close of the Antarctic Treaty Consultative Meeting at which it was adopted, unless one or more of the Consultative Parties notifies the Depository within that time period, that it wishes an extension of that period or is unable to approve the measure.
2. Having regard to the provisions of Articles 4 and 5 of the Protocol, no marine area shall be designated as an Antarctic Specially Protected Area or an Antarctic Specially Managed Area without the prior approval of the Commission for the Conservation of Antarctic Marine Living Resources.
3. Designation of an Antarctic Specially Protected Area or An Antarctic Specially Managed Area shall be for an indefinite period unless the Management Plan specifies otherwise. A review of the Management Plan shall be initiated at least every five years. The plan shall be updated as necessary.
4. Management Plans may be amended or revoked in accordance with paragraph 1 above.
5. Upon approval Management Plans shall be circulated promptly by the Depository to all Parties. The Depository shall maintain a record of all currently approved Management Plans.

Article 7
Permits

1. Each Party shall appoint an appropriate authority to issue permits to enter and engage in activities within an Antarctic Specially Protected Area in accordance with the requirement of the Management Plan relating to the area. The permit shall be accompanied by the relevant sections of the Management Plan and shall specify the extent and location of the area, the authorized activities and when, where and by whom the activities are authorized an by any other conditions imposed on this plan.
2. In the case of a Specially Protected Area designated as such by past Antarctic Treaty Consultative Meeting which does not have a Management Plan, the appropriate authority may issue a permit for a compelling scientific purpose which can not be served elsewhere and which will not jeopardize the natural eco-logical system in that area.
3. Each Party shall require a permit-holder to carry a copy of the permit while in the Antarctic Specially Managed Area concerned.

Article 8
Historic Sites and Monuments

1. Sites or monuments which have been designated as Antarctic Specially Protected Areas or Antarctic Specially Managed Areas, or which are located within such areas, shall be listed as Historic Sites and Monuments.
2. Any Party may propose a site or monument of recognized historic value which has not been designated as an Antarctic Specially Protected Area or an Antarctic Specially Managed Area., or which is not located within such an area, for listing as a Historic Site or Monument. The proposal for listing may be approved by the Antarctic Treaty Consultative Meeting in accordance with Article IX (1) of the Antarctic Treaty. Unless the measure specifies otherwise, the proposal shall be deemed approved 90 days after the close of the Antarctic Treaty Consultative Meeting at which it was adopted, unless

one or more of the Consultative Parties notifies the Depository, within that time period, that it wishes an extension of that period or is unable to approve the measure.
3. Existing Historic Sites and Monuments which have been listed as such by previous Antarctic Treaty Consultative Meetings shall be included in the list of Historic Sites and Monuments under this Article.
4. Listed Historic Sites and Monuments shall not be damaged, removed or destroyed.
5. The list of Historic Sites and Monuments may be amended in accordance with paragraph 2 above. The Depository shall maintain a list of current Historic Sites and Monuments.

Article 9
Information and Publicity
1. With a view to ensuring that all persons visiting or proposing to visit Antarctica understand and observe the provision of this Annex, each Party shall make available information setting forth, in particular:

(a) the location of Antarctic Specially Protected Areas and Antarctic Specially Managed Areas;
(b) listing and maps of those areas;
(c) the Management Plan, including listings of prohibitions relevant to that area;
(d) the location of Historic Sites and Monuments and any relevant prohibition or restriction.

2. Each Party shall ensure the location and, if possible, the limits of Antarctic Specially Protected Areas, Antarctic Specially Managed Areas and Historic Sites and Monuments are shown on its topographical maps, hydrographic charts and in any relevant publications.
3. Parties shall co-operate to ensure that, where appropriate, the boundaries of Antarctic Specially Protected Areas, Antarctic Specially Managed Areas, and Historic Sites and Monuments are suitably marked on the site.

Article 10
Exchange of Information
1. the Parties shall make arrangements for:

(a) collecting and exchanging records, including records of permits and reports of visits, including inspection visits, to Antarctic Specially Protected Areas and reports of inspection to Antarctic Specially Managed Areas.
(b) obtaining and exchanging information on any significant change or damage to any Antarctic Specially Protected Areas or Antarctic Specially Managed Area, or Historic Site or Monument; and
(c) establishing common forms in which records and information shall be submitted by Parties in accordance with paragraph 2 below.

2. Each Party shall inform the other Parties and the committee before the end of November of each year of the number of permits issued under this Annex in the preceding period of 1st July to 30th June.
3. Each Party conducting, funding or authorizing research or other activities in Antarctic Specially Protected Areas or Antarctic Specially Managed Areas shall maintain a record of such activities and in the annual exchange of information in accordance with the Antarctic Treaty shall provide summary descriptions of the activities conducted by persons subject to its jurisdiction in such areas in the preceding years.
4. Each Party shall inform the other Parties and the Committee before the end of November each year of measures it has taken to implement this Annex, including any site inspections and any steps it has taken address instances of activities in contravention of the provisions of the approved Management Plan for an Antarctic Special Protected Area or Antarctic Specially Managed Area.

Article 11
Cases of Emergency
1. The restrictions laid down and authorized by this Annex shall not apply in cases of emergency involving the safety of human life or of ships, aircraft, or equipment or facilities of high value or the protection of the environment.
2. Notice of activities undertaken in cases of emergency shall be circulated immediately to all Parties and the Committee.

Article 12
Amendment or Modification

1. This Annex may be amended or modified by a measure adopted in accordance with Article IX (1) of the Antarctic Treaty. Unless the measure specifies otherwise, the amendment or modification shall be deemed to have been approved and shall become effective one year after the close of the Antarctic Treaty Consultative Meeting at which it was adopted, unless one or more Parties notifies the Depository, within that time period, that it wishes an extension of that time period or that it is unable to approve the measure.
2. Any amendment or modification of this Annex which becomes effective in accordance with paragraph 1 above shall hereafter become effective as to any other Party when notice of approval by it has been received by the Depository.

Scott Polar Research Institute

ANTARCTIC TREATY

Made 1 December 1959; came into force 23 June 1961. (The Treaty has no limit on its duration. It may be reviewed, at the request of a Consultative Party.)

Contracting Parties; in chronological order.

Britain	*31 May 1960*	
South Africa	*21 June 1960*	
Belgium	*26 July 1960*	
Japan	*4 August 1960*	
United States of America	*18 August 1960*	
Norway	*24 August 1960*	
France	*16 September 1960*	
New Zealand	*1 November 1960*	
Russia [3]	*2 November 1960*	
Poland	**8 June 1961**	(29 July 1977)
Argentina	*23 June 1961*	
Australia	*23 June 1961*	
Chile	*23 June 1961*	
Czech Republic [4]		
Slovakia [4]	14 June 1962	
Denmark	20 May 1965	
Netherlands	**30 March 1967**	(19 November 1990)
Romania	15 September 1971	
Germany, DDR [1]	**19 November 1974**	(5 October 1987)
Brasil	**16 May 1975**	(12 September 1983)
Bulgaria	**11 September 1978**	(25 May 1998)
Germany, BRD [1]	**5 February 1979**	(3 March 1981)
Uruguay	**11 January 1980**	(7 October 1985)
Papua New Guinea [2]	16 March 1981	
Italy	**18 March 1981**	(5 October 1987)
Peru	**10 April 1981**	(9 October 1989)
Spain	**31 March 1982**	(21 September 1988)
China, Peoples' Republic	**8 June 1983**	(7 October 1985)
India	**19 August 1983**	(12 September 1983)
Hungary	27 January 1984	
Sweden	**24 April 1984**	(21 September 1988)
Finland	**15 May 1984**	(9 October 1989)
Cuba	16 August 1984	
Korea (Seoul)	**28 November 1986**	(9 October 1989)
Greece	8 January 1987	
Korea (Pyongyang)	21 January 1987	
Austria	25 August 1987	
Ecuador	**15 September 1987**	(19 November 1990)
Canada	4 May 1988	
Colombia	31 January 1989	
Switzerland	15 November 1990	
Guatemala	31 July 1991	
Ukraine	28 October 1992	
Turkey	24 January 1996	
Venezuela	24 March 1999	

Original signatories; 12 states which signed the Treaty on 1 December 1959, are *italicised*; the dates given are those of the deposition of the instruments of ratification, approval, or acceptance of the Treaty.

Consultative Parties of the Treaty; 27 states (emboldened), the 12 original signatories and 15 others which achieved this status after becoming actively involved in Antarctic research (with dates in brackets). A total of 44 states are adherent to the Treaty.

[1] The two German states unified from 3 October 1990.

[2] Papua New Guinea declared its succession to the Treaty after becoming independent of Australia.

[3] Formerly the Soviet Union, represented by Russia from December 1991.

[4] Succeeded to the Treaty as part of Czechoslovakia which divided into two republics from 1 January 1993.

[<TREATY> 15 April 1999 R. K. Headland.]

The framework of the ASMA model plan

1. **Description of the area**
   - I. *General Description:*
   - II. *Geographic coordinates, boundary markers, and natural features*
   - III. *Description and coordinates of landing point*
   - *IV.* *Climate*

2. ***Aims and Objectives***

3. **Management activities**

   With regard to the basic guidelines as provided by the Protocol, and its Annexes I-V, and the relevant ATCM recommendations, the following management activities are proposed for the area (ATCM XX/WP 15, 1996):

4. ***Proposals for designation of new protected areas***

5. **Access by land, sea, air**

6. ***Location of permanent structures***

7. ***Location of minor and/or semi-permanent structures***

8. **Protected zones**
   - I. *Protected zones within the ASMA*
   - *II.* *Other Protected Areas within proximity*

9. ***Areas in which activities should be regulated***
   - I. Zones visited by tourists
   - II. Zones of scientific and/or ecological interest where access of tourists and other visitors should be controlled
   - *III.* Research activities in the area

10. ***Installation, modification, or removal of structures and location of field camps:***

    Installation of new stations/refuges and modifications, or removal of already existing installations or other facilities in the Area, and location of field camps should be done only after consultation with the Parties that have active research programmes in the Area, and in conformity of Article 8 and Annex 1 of the Environmental Protocol (ATCM XX/WP 15, 1996).

11. ***Taking or harmful interference with native fauna and flora***

    Taking or harmful interference with native fauna and flora shall only occur in accordance with a permit issued under Article 3 of Annex 2 to the Protocol on Environmental Protection (ibid.).

12. ***Collection and removal of anything not brought into the area by the visitor:*** *In accordance with the Protocol on Environmental Protection souvenirs, specifically rocks, minerals, fossils, eggs, flora and fauna, or any other material not brought into the area by the visitor, shall not be collected in, or removed from, the Area* (ibid.).

13. ***Visits by tourists, and non-governmental expeditions***

14. ***Disposal of waste***

15. **Maps, Charts, Photographs, and Pilot**
    I. *Maps*
    II. *Nautical Charts*
    III. Photographs:
    IV. British Admiralty Antarctic Pilot (1974, 1997):

16. **Notifications and reports**

17. ***Period of Designation:***

18. ***Review procedures***

    `This management plan will be reviewed every five years, and updated as required. Proposed revisions will be provided to SCAR and other relevant components of the ATS for comment, and shall be submitted to the ATCP for adoption in accordance with established procedures (ibid.).

19. **Tourism**

20. **History**

21. ***Physiography and Geology***

22. ***Biology***

23. ***Recommended Reading***

24. ***Maps, tables, and photographs of the area***